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174



Vol. XXX

New York, U. S. A., Thursday, December 28, 1911.

No. 1

DISSENSION DISRUPTS THE DURYEA

**New Company in Saginaw Rent in Twain—
Duryea Himself Starts Anew While
Company Will Reorganize.**

Before it fairly had commenced operations, the Charles E. Duryea Co., which only a few months ago was organized in Saginaw, Mich., and which took over the business of Charles E. Duryea, of Reading, Pa., has been split in twain owing to internal dissensions, and as a result two blades of grass will grow where but one grew before; that is to say, Duryea has left the Saginaw company and will again set up for himself, while the Charles E. Duryea Co. will undergo reorganization and find a new name for itself.

As nearly as can be learned, the trouble which caused the split was due to an effort to wrest control of the company from Duryea. When he removed his plant from Reading, Pa., he took with him R. S. Crawford, of Hagerstown, Md., and F. H. Clum, of Rochester, N. Y., and Detroit, Mich. Crawford was to be production engineer and had a contract to build the Duryea car, while Clum was to dispose of stock, chiefly by mail. In addition to other compensation, both men were to receive an allotment of common stock and were to become members of the board of directors.

In due course, Duryea was elected president of the new company and Crawford vice-president, Clum being made a director in accordance with the agreement. Clum, it is stated, was not particularly successful in his stock-selling campaign, and when friction arose both he and Crawford took sides against Duryea, an effort being made to modify Crawford's contract in a manner which Duryea believed would be injurious to his holdings. Duryea then resorted to law and obtained an injunction preventing the modification of the Crawford agreement. In the meantime the anti-Duryea forces entered suit charging in substance that Duryea had not made good his prom-

ises. Duryea then tendered a bond to make up any deficiency and arranged for money to finance the company, but the fight for common stock, which controlled the company, continued and was finally settled by the purchase, through C. C. Brooks as trustee, of Duryea's stock, Duryea obtaining part cash and retaining the right to the name Duryea, also to the Reading assets and the pleasure car end of the business with full rights to manufacture such cars under the patents.

When he stepped out, Duryea secured temporary headquarters in Saginaw, where he is building a few buggies to fill orders in hand, but at the same time he is seeking another location and will form another company and begin all over again. The Duryea Auto Co., from which he withdrew, will adopt a new name at a meeting of the directors which is to be held today, and will continue operations producing commercial vehicles only, however. In the reorganization which has been partially completed, Frank G. Palmerton was elected president and general manager to succeed Duryea. The other officers are: Vice-president, R. S. Crawford; secretary and treasurer, Joseph Seemann, who with C. C. Brooks and F. H. Clum are the men who constitute the board of directors.

General Motors Sells Randolph Plant.

The Randolph Motor Co., of Flint, Mich., one of the General Motors Co.'s truck-producing properties, has been sold to Eugene G. Goldman, of Chicago, who was the chief owner of the Randolph company when it was acquired by General Motors two years ago. Goldman will continue to operate the plant, and, if anything, will increase the output of trucks.

The Finish of Detroit's Goodfellow.

The assets of the Goodfellow Tire Co., of Detroit, Mich., were disposed of at private sale on Tuesday last, the 26th inst., by the trustee in bankruptcy. The property consisted of Timtest inner tubes, Cassettes and the machinery necessary for the manufacture of those non-puncturable devices.

DYER BEGINS WHOLESALE LITIGATION

**Three Manufacturers Already Sued—Brings
to Bear Two Patents Not Included in
A. L. A. M. "Group of Five."**

Leonard H. Dyer, of Greenwich, Conn., who is of the New York law firm of Dyer, Dyer & Taylor, is preparing to sue "every-one who manufactures automobiles" to quote his own language. As a matter of fact, in his own name he already has brought suit against the Palmer & Singer Mfg. Co., of New York, for alleged infringement of his patent No. 657,650, covering a guide plate for change speed levers, but it is in the name of the Enterprize Automobile Co., which apparently consists of himself and his brother, that he will prosecute most of his actions.

He is the possessor of at least two patents which he believes rival the more or less lamented Selden patent in their extent and scope, and which are separate and distinct from the better known group of five Dyer patents which were controlled by the Association of Licensed Automobile Manufacturers to whose assets and activities the Automobile Board of Trade fell heir when the Selden patent blew up last January, and which are the five Dyer patents under which the members of those organization were privileged to acquire shop rights. Patent No. 657,650 is one of the five, but it so transpired that Palmer & Singer did not secure the shop right, hence their singling out by the Dyer interests.

The patents under which Dyer, or the Enterprize Automobile Co.—Enterprize spelled with a z—expects to sue the whole trade, or at any rate that portion which refuses to pay royalty, are Nos. 885,986 and 921,863, and these form the basis of other suits which have been entered in the United States Circuit Court for the Southern District of New York against the Palmer & Singer Mfg. Co., Winton Motor Carriage Co., and the Maxwell-Briscoe Motor Co. Similar actions against a large number of

other manufacturers are in course of preparation. The particular inventions which Dyer claims as his very own and which are contained in patent No. 385,986 are a gear box, with sliding gear giving a plurality of speeds, one of which is a direct drive and also having a reverse. The later patent, No. 921,963, covers a sliding gear, affording a direct drive and providing for a general arrangement with the engine in front and a longitudinal shaft. Dyer and the fellow members of his law firm are full of confidence that the actions they already have instituted and the many others which are to follow will result in the general recognition of their claims.

Palmer & Singer, Winton and Maxwell & Briscoe all are members of the Automobile Board of Trade and the suits will be defended by that organization. Whether or no the defence will seek to prove that the two patents now brought to bear were included in the contract originally executed with the Association of Licensed Automobile Manufacturers is a matter of some speculation. The Board of Trade counsel will neither affirm nor deny the suggestion but with the knowledge that the two patents now involved were in existence, it is a matter for remark, and appears significant that they should have escaped the scope and terms of the royalty agreement which was made, and which covered the "group of five." The patents in this group respectively apply to a guide plate for change speed levers, a unit power plant, a sliding gear with direct drive in special form and two types of gearing which at present are not in use.

Axle Plant Becomes Studebaker's Own.

Having fulfilled the conditions imposed by the local Chamber of Commerce, title to the real estate and plant which it has operated in Port Huron, Mich., last week was vested in the Studebaker Corporation which now owns the property absolutely. The plant originally was occupied by the Northern Motor Car Co., which was taken over by the E-M-F Co., which in turn was absorbed by the Studebaker corporation. It was employed in producing the axles for the Studebaker cars and has been styled E-M-F factory No. 2. The conditions that have been fulfilled required that the factory be operated for five years and dispense at least \$200,000 per year in wages for five years.

Buyers Found For Bankrupt Plant.

The Eddy brothers, who are described as millionaire lumber men of Bay City, Mich., are reported to have practically completed the purchase of the machinery, parts and patent rights of the Owosso Motor Co., of Owosso, Mich., which recently was thrown into bankruptcy after its directors had voted to wind up the business. If the deal is completed it is stated that the manufacture of the Owosso light truck will be recommenced in Bay City.

TWITCHELL CLAIMS THE TIRE GAUGE

Californian Institutes Patent Campaign in the East—Suits Filed Against Schrader and Allen and Others.

Fortified by a decision obtained in the United States Circuit Court for the Southern District of California, Southern Division, and secure in the belief that his patent, No. 927,289 of July 6, 1909, controls practically all of the pencil shaped air pressure tire gauges which recently have become so popular, Charles R. Twitchell, of Los Angeles, has moved eastward to prosecute an infringement campaign against a number of such devices manufactured in this part of the country. He last week made the Allen Auto Specialty Co., of New York, a defendant in such an action, which suit will be followed by about ten others which at present are in the course of preparation.

Twitchell already had sued A. Schrader's Son, Inc., of New York, and that case was due to come up two weeks since, but owing to a change of Schrader's counsel, the hearing was postponed. There also is an action pending against the New York Sporting Goods Co. for selling an alleged infringing device.

As stated, Twitchell broadly claims the right to all pencil shaped tire pressure gauges which are minus threaded couplings. Until Twitchell produced his device it is claimed that all other pressure gauges required either glass covered dials or threaded couplings. The suit which he won in California was against the Northern Auto Pressure Gauge Co., of Los Angeles, which operated under patent No. 948,526, of February 8, 1910. Later Twitchell sued the Rudolph & West Co., of Washington, D. C., and on October 26, 1911, obtained a verdict from the Supreme Court of the District of Columbia. He also brought action against the Prest-O-Lite Co., of Indianapolis, several of whose branches sold an alleged infringing gauge, the manufacturer of which was unknown to Twitchell. The Prest-O-Lite Co. then secured a preliminary injunction restraining Twitchell from prosecuting such suits, but the injunction was short-lived, as two months later Twitchell secured a permanent decree pro confesso.

Maytag-Mason to Raise \$60,000 Loan.

Light finally has commenced to break on the tangled affairs of the Maytag-Mason Co., of Waterloo, Ia., and it now seems as if the company will be enabled to weather the storm, and to meet its most pressing obligations. The financial difficulties of the company came to a head last August, when bankruptcy proceedings seemed imminent, and an application for a receivership was filed. The troubles arose

from the tying up of the available capital in buildings, real estate and equipment, leaving insufficient funds for the carrying on of manufacturing operations. To secure these funds a loan of \$60,000 is to be floated, secured by a deed of trust of all the property of the company, valued at more than \$250,000, to Fred W. Powers, of Waterloo, as trustee.

The deed, which was executed last week, is signed by W. B. Wallis, as president, and E. R. Mason, as secretary, for the company and is for the equal pro rata benefit and security of the holders of an issue of bonds in varying amounts, aggregating \$150,000.

Following the conveyance of the deed the directors of the Waterloo Chamber of Commerce met to discuss the financial status of the company and to take steps to assist in the reorganization plan.

Kelsey's Liabilities Exceed \$75,000.

Schedules in bankruptcy of the C. W. Kelsey Mfg. Co., Hartford, Conn., which failed some three weeks ago, were filed in the United States District Court on Friday last. They show assets of \$76,084.80 and liabilities of \$75,226.16. The assets are: Stock in trade, \$61,376; vehicles, \$1,800; machinery, tools, etc., \$823.90; debts due on open accounts, \$2,000; stocks, bonds, etc., \$7,949.56; unliquidated claims, \$2,235.34. The liabilities are: Taxes, \$430.62; wages, \$1,687.24, unsecured claims, \$73,108.30. There are 226 unsecured creditors, many of them agents in the South, who apparently had placed orders for the three-wheel "motorettes," which the Kelsey company manufactured.

Tacoma Dealers Form an Association.

With the intention of standardizing garage charges and the price of supplies, the retail dealers and garage owners of Tacoma, Wash., have formed the Tacoma Automobile Dealers' Association and elected the following officers: President, Edwin C. Chambers; vice-president, T. W. Little; secretary-treasurer, Harry W. Doherty; trustees, C. L. Ross, W. W. Wing, E. C. Reynolds.

Dates of Board of Trade Meetings.

The regular monthly meeting of the board of directors of the Automobile Board of Trade which was due to occur on January 3rd, has been deferred until Monday, January 8th. As the annual meeting and election of the organization falls on the 9th, the date of the Board meeting was changed to facilitate matters.

Locomotive to Establish London Branch.

In April next, the Locomobile Co., of America, will open a branch in London. It will be the American first manufacturer of high-priced cars exclusively to take the step, which will add fuel to the "American invasion" talk, which now is rife in Great Britain.

COLLECTING EVIDENCE IN EUROPE

United States Court Grants Necessary Order in Warner-Stewart Speedometer Suit—Many Anticipations Cited.

Testimony now is being taken abroad in the suit of the Warner Instrument Co., of Beloit, Wis., against the New York corporation of the Stewart & Clark Mfg. Co., which involves the magnetic features of the respective speedometers made by the parties to the action. The defendants cited so many alleged foreign anticipations of the Warner patent, that the United States Circuit Court for the Southern District of New York, in which the case is pending, readily granted the application to take corroborative evidence abroad. According to the court's ruling the evidence may be taken by "any competent person," whose appointment need not be verified by special order of the court, but who must substantiate his report by the usual affidavits.

The suit hinges upon patent No. 823,237, issued on June 12, 1906, to Arthur P. Warner and Charles H. Warner, and assigned by them to the Warner Instrument Co., of Beloit, Wis., and charges the Stewart & Clark Mfg. Co. with infringement.

In its bill of complaint the Warner company recites the history of the patent and, in particular, lays stress upon the device for regulating the electrical effect in varying atmospheric temperatures. It alleges that the speedometer brought out by the Stewart & Clark company is an infringement, and asks for the usual judgment and accounting.

In a voluminous answer to this complaint, the Stewart & Clark company, which is strenuously contesting the action, declares that the device claimed to constitute means "for automatically compensating for variation in electrical effect due to variation in atmospheric temperature in a magnetic tachometer is utterly, totally and inherently inoperative for any such purpose, or for any useful purpose bearing any relation to the purposes of a magnetic tachometer." It furthermore claims that Warner's invention had been known and described in no less than 55 United States patents, dating from May 9, 1871 (No. 114,644, issued to J. P. Clark), to April 6, 1909 (No. 917,139, issued to W. H. Pratt), all of which are named in the answer, as well as in "sundry other United States patents which the defendant so far has not been able to learn the number and dates of." It makes the same claim for six British, two German, one French and sundry other foreign patents. As to the making and marketing of such devices in this country, the brief states that magnetic tachometers of the Warner type were manufactured and sold by Thomas Duncan, of Chicago, Ill., the General Electric Co., of New York

City, Siemens & Halske, of Chicago, Ill., and the Weston Electric Instrument Co., of Newark, N. J.

Klaxon Stops One More Price-Cutter.

Henry Phillips, of New York, is another man who will not be able to sell or to trifle with the prices of Klaxon and Klaxonet horns. The United States Circuit Court for the Southern District of New York has issued a preliminary injunction forbidding him to do so. Phillips, who traded at 1931 Broadway, under the high-sounding designation H. Phillips Rubber Works, gave no heed or small heed to the license tags attached to the Klaxon productions, and when he began cutting prices the Lovell-McConnell Mfg. Co. promptly filed a suit against him for infringing its patents and otherwise violating its license conditions. Phillips did not put in an appearance when the motion for a preliminary injunction was made, and the latter was granted.

Hewitt's New Company Chooses Officers.

E. R. Hewitt has been elected president of the new million dollar Hewitt Motor Co., of New York, which was organized last week when E. R. Hewitt and his associates re-acquired the Hewitt truck interests from the Metzger Motor Car Co., of Detroit. At the election, which occurred yesterday (Wednesday), R. C. Gildersleeve was chosen secretary and treasurer. Gildersleeve had been general manager of the Metzger truck department since the time the Hewitt interests were merged with it two years ago. The directors of the Hewitt Motor Co., as stated last week, are William E. Corey, E. C. Converse, M. F. Burns and Ambrose Monel, all of whom are New York millionaires, and directors in various industrial enterprises.

Pittsburgh Gets Miller Carburetter.

The new Miller Mfg. Co., which proposed manufacturing the New Miller carburetter, a California invention, in Detroit, has found a plant in Pittsburgh, Pa., and will begin operations there, instead of in the Michigan city. It is expected that the carburetters will be ready for marketing before the end of January. E. J. Edmond, who has been the New York representative for the Schebler carburetter, has become interested in the Miller device, for which he will have the agency for all of the Eastern States.

Argentine Depot for General Motors.

Johnson Martin, manager of the South American division of the General Motors Export Co., is due to leave New York today for Buenos Aires, where he will take charge of a General Motors' depot, which he will establish there. Martin is familiar with the territory, having spent several years in Brazil, Argentina and other countries of South America in the interests of other United States enterprises.

ROSE SUITS BRING NOTABLE RULING

Held Not to be Multifarious and Coupling of Several Defendants Justified—License Bracket Strengthened.

In a decision handed down last week by Justice Rellstab, in the United States Circuit Court for the District of New Jersey, not only were the Rose Mfg. Co.'s patents covering the Neverout license bracket strengthened, but what is of even more general importance, the Court upheld a complainant's right to include in a single suit in each judicial district all the makers, jobbers, dealers or users who in that particular district may be engaged in the same acts of infringement, and also to base a suit of the sort on several correlated patents instead of making each patent the basis for a separate suit. This ruling follows the trend of recent decisions of the Supreme Court of the United States and is designed to put an end to at least some of the law's delays and the law's expensiveness, which so often are complained of.

The defendants in the Rose suit were the E. A. Whitehouse Mfg. Co. and the Le Compte Mfg. Co., both of whom were charged with infringing patents No. 883,973, applying to the Neverout lamp bracket; No. 962,220, covering the Neverout license bracket, and design patents Nos. 41,388 and 41,389, which cover the design of the Neverout license tag. The defendants did not file an answer, as is usual in such cases, but instead filed a demurrer, which demurrer Judge Rellstab overruled.

The demurrer contended that the Rose complaint was multifarious, that the design patents are void as covering subject matters improper for design patents, and that the mechanical patents are invalid as covering an aggregation and not a combination of elements. In reply to the Rose claim that the four patents "are capable of conjoint use and are in fact conjointly used by the defendants" and that the latter acknowledged that they had "jointly infringed" said four letters patent by the manufacture and sale of articles embodying such inventions, the defendants drew the Court's attention to the fact that the Rose company did not aver that the conjoint use is in the single structure, which admission, however, Judge Rellstab held not to be fatal. If they are used together in furtherance of a common purpose, he said, "that is sufficient conjoint use on the question of multifariousness." Conjoint use, he held, is not the controlling factor which determines multifariousness.

He said: "A suit will not be held multifarious though the patents sued upon are not capable of conjoint use when it appears that all of them are being infringed by all of the defendants working together in pursuance of the common purpose to

manufacture or vend the infringed devices, and that the combining of such controversies in one suit produces less inconvenience to the Court and the litigants and results in less expense and less time in securing a final disposition of the controversies than would ensue by splitting them up into separate suits." Multifariousness, the Court defined as being "the improper joining in one bill of distinct and independent matters and thereby confounding them," and he said a bill of complaint will not be treated as multifarious if it joins two or more good causes of complaint if they grow out of the same transaction where all the defendants are interested in the same claim of right and where the relief asked for in relation to each is of the same general character." The determining whether a bill is multifarious, Judge Rellstab said, rests in the sound discretion of the Court.

In dealing with the other allegation the Court ruled that a patent would not be held as invalid on demurrer unless the Court is entirely satisfied from its face that by no possible proof can patent ability, invention and validity be made to appear. Inspection of the Rose patents left Judge Rellstab's mind in "a state of dubiety" as to their patentability. He, therefore, held that the complainant is entitled to submit proof to support the presumption of validity that goes with the grant of the patent and in overruling the demurrer he gives the defendants twenty days to answer on the payment of costs of the demurrer.

Penn Unit Plant Sold at Auction.

The plant of the Penn Unit Automobile Co., Allentown, Pa., in which it is said \$200,000 had been sunk, was sold at auction last week, and brought \$45,000. Buildings, machinery and real estate were sold piecemeal, the latter being acquired by the president of the Second National Bank of Allentown for \$18,000.

Purchasers in Sight for Parker Plant.

The Henry & Wright Mfg. Co., of Hartford, Conn., is negotiating for the purchase of the plant of the Parker Motor Co. in that city, and it is likely that the deal shortly will be consummated. The Parker factory has been on the market since the company made an assignment last summer.

Shawmut Opens Branch in Los Angeles.

The Shawmut Tire Co., of Boston, has opened a branch in Los Angeles at 311 West Pico street, in a new building which just has been completed at that address. The new store will be in charge of J. Clark Smith, J. Warren Smith and S. H. Ellis, Jr.

Schrup to Head Dubuque Dealers.

A. F. Schrup has been elected president of the Dubuque Auto Dealers' Association, which was formed last week in the Iowa city. The other officers are: Vice-president, A. L. Walsh; secretary-treasurer, D. H. McCarthy.

S. A. E. MAPS PROMISING PROGRAM

Long List of Interesting Subjects for Discussion at Annual Meeting—Observations Abroad to be Related.

Electing officers for the ensuing year will constitute but a small part of the doings at the annual meeting of the Society of Automobile Engineers which occurs in New York and which will occupy the three days, January 18, 19 and 20; the Assembly hall of Madison Square Garden will be the scene of the meeting.

Discussions of what was seen and learned during the recent foreign visit of the S. A. E. party will be a part of the program, which, however, will be made up chiefly of reports of the many committees and the reading of a number of papers of technical interest by members versed in the several subjects.

The subject of the recent European visit will be introduced generally by Henry F. Donaldson, and will be followed by discussions of wire wheels by C. B. Hayes and Bert Morley, in the course of which the results of some new comparative tests of crushing and dishing strength of hickory and wire wheels will be submitted. Silent chains for accessory motor drives and for gear boxes will be taken up. The worm gear drive will be handled by David Ferguson, E. R. Whitney, C. E. Davis and W. C. Baker. Sleeve-valve motors will also be treated at considerable length, Howard E. Coffin, Henry Souther and J. B. Hull entering into the discussion. R. A. Lloyd, A. J. Slade, A. B. Cumner and B. B. Bachman, who went abroad with eyes chiefly for trucks, will tell of what they saw that was particularly interesting in the design and operation of foreign commercial vehicles.

As at present arranged the set papers that will be read are as follows:

Disintegration of Fuel Particles and Homogeneous Carbureting of Air, by Forrest A. Heath. Standardization of Drawings, by George W. Dunham. Compound Gas Engines and Their Efficiency, by Eugene P. Batzell. Present Status of Automobile Lighting, Gas and Electric, by J. W. Esterline and A. E. Berdon. Position of Brakes; Double-rear-wheel versus Propeller-shaft; front wheel brakes, by S. I. Fekete. Definitions in Connection with Physical Properties of Steel, by Henry Hess. Mechanical Points in Connection with the Construction of Solid Motor Tires, by Charles B. Whittelsey. Silent Chains, by Chester S. Ricker. Automatic Spark Advance, by Lon R. Smith. Underslung Frames, by S. I. Fekete. Balance of Motors, by Ernest R. Fried. Self-Starters for Gasoline Motors, by J. W. Fitzgerald. Multiple Disk Clutches, by Joseph A. Anglada. Increasing the Utility of Commercial Cars

by Auxiliary Loading and Unloading Devices, by E. W. Curtis, Jr.

In connection with the report of the Miscellaneous Committee, or Division, these subjects will be brought up:

Standard Gauge Tread for Pleasure and Commercial Vehicles; Electric Lighting Outfits; Magneto Dimensions; Spark Plug Thread Tolerance; Vehicle Taxation Formula; Metal Gauges; Oversize Standards for Pistons; Bushed Yoke and Eye Rod Ends; Limits for S. A. E. Screw Threads.

Changes Among Prominent Tradesmen.

Albert H. Doolittle, advertising and publicity manager for the Knox Automobile Co., Springfield, Mass., has resigned his position. His resignation takes effect January 1st.

A. R. Rousseau, who was at one time manager of the Buick branch of Chicago, has been appointed western sales manager for the Imperial Motor Car Co., of Jackson, Mich. He will make his headquarters at 2216 Michigan avenue, Chicago.

J. L. Elwood, until recently engineer for the Samuel L. Moore Sons Co., of New York, has become attached to the service department of the Remy Electric Co., of Anderson, Ind. As Elwood was at one time assistant superintendent of production at the Remy plant, he is no stranger to his new duties.

J. N. Atwood has been appointed manager of the Buick branch in Dallas, Texas. He succeeds F. W. A. Vesper, who has been appointed assistant sales manager of the Buick Motor Co., which carries with it removal to Flint, Mich. Atwood was Vesper's chief assistant in the management of the Dallas branch.

H. B. Frye, Jr., for the past two years manager of the Standard Automobile Co. of Pittsburgh, Pa., has resigned in order to re-engage in the steel business. He will be succeeded by William P. Berrien, formerly president and general manager of the Stoddard-Dayton Automobile Co. of Philadelphia.

L. A. Hawley has resigned the management of the Chicago branch of the Consolidated Rubber Tire Co., and become manager of the Motz Tire & Rubber Co.'s establishment in the same city, at 2023 Michigan avenue. Before he joined the Consolidated company he was identified with the Motz people, and his present change is very much in the nature of a "homecoming."

William O. Kennington has been appointed assistant chief engineer for the Remy Electric Co., of Anderson, Ind. Kennington, who for four years was technical manager for the Simms Magneto Co., of London, came to this country in a similar capacity when the Simms company established its American plant about a year since, all of which implies that he knows magnetos from A to Z.

WEED AFTER THE "NON-CREEPERS"

Declares Even "Anchored" Chain Grips Must Creep and Acts Accordingly—Secures New Batch of Injunctions.

Following up its vigorous campaign to protect its tire chains from infringement, the Weed Chain Tire Grip Co., of New York City, on December 23d, obtained a preliminary injunction against the Automobile Co-Operative Association of New York, restraining the latter from handling the various kinds of tire grips sold by that company, including the Pegley grip, which is provided with an anchor for fastening the grip to the spokes, and the Atlas grip which has flat links in the cross chains and heavy tension springs in the side chains. A few days previous a preliminary injunction had been granted in Chicago against the Weeder grip, made by the Perry Chain Co., whether sold in reels or in assembled form, and against the Perry grip, the cross members of which are provided with springs to make the grip fit more tightly.

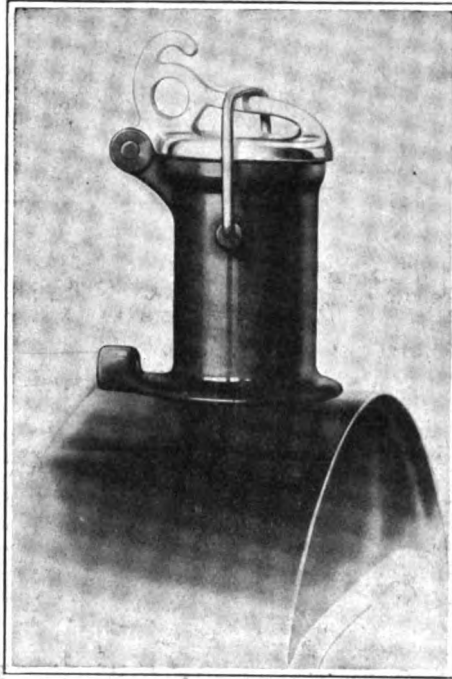
These new injunctions are the outcome of a discovery made by the Weed attorneys, that in various parts of the country, through the medium of "non-creeping" chains, attempts are being made to dodge the Parsons patent, which had been declared valid by the Circuit Court of Appeals in Chicago, in the suit against the Excelsior Supply Co., which decision became final when the Supreme Court of the United States on December 4th refused to review the case on a writ of certiorari. The manner in which the "creeping" of the tire chain—which is the fundamental and basic part of the Parsons patent—was to be avoided, differed in the various chains offered for sale. Generally it consisted in anchoring the cross chains to the rim or to the spokes of the wheel in such a manner as to prevent undue creeping. The makers believed that such anchoring would evade the issue of the Parsons patent, but in their arguments which resulted in the injunctions, the Weed attorneys maintained that although the catalogs or descriptions of "non-creeping" or "anchored" chains may state that they are to be drawn "tight" on the tire, such tightness is largely theoretical, and that as soon as the chain moves along the tire even a fractional part of an inch, the letter and the spirit of the Parsons patent are violated, and a case of infringement of the "creeping" device is constituted.

Among others enjoined by the Weed company are the H. Chaunon Co., the McKinnon Chain Co., the Seneca Chain Co., the Cleveland Chain and Mfg. Co., and Newhall Chain, Forge and Iron Co., who are prohibited from selling cross chains or other parts adapted and intended for use

even in the manufacture and repair of chain grips.

To Distinguish the Six-Cylinder Car.

Of the many distinctive features which render certain makes of cars easily recognizable even to the man in the street, it is doubtful if there are any which are relied upon to a greater extent than the shape of the hub caps and design of the radiator cap. But whereas it is not always possible to scrutinize the hub caps of a rapidly moving car, the radiator cap at least is in plain view



for a considerable distance, which fact has been borne in mind by the manufacturers of the Packard cars in adopting a unique type of cap for the new "Sixes." Instead of being formed into a flat wing, as is the case in the radiator caps which are used on the Packard four-cylinder cars, the top of the new cap is cast in an open-work figure six. It therefore serves not only to help in the identification of Packard "sixes" among other cars of similar outline, but also distinguishes the Packard "fours" from the "sixes."

Federal Circuit Courts to Be Abolished.

On January 1, 1912, the United States Circuit Courts will cease to exist and the cases under their jurisdiction will be transferred to the District Courts located in the respective circuits. During the past few years it has become more and more evident that the jurisdiction of the Circuit Courts, in which most patent causes are filed, and that of the District Courts frequently overlap, so that a great deal of confusion has been evident in Federal cases. Realizing this state of affairs, the Department of Justice has decided to abolish the Circuit Courts altogether. The judges now sitting in these courts will be assigned to duty in the respective District Courts, the latter being proportionately enlarged.

SEES CONSPIRACY IN ELKHART SALE

Trustee Declares Disposal of Property to Elmer Auto Corporation Irregular—Asks Court to Nullify Transfer.

Although after a lapse of several months and after opposing the petition which had been filed against it, the Elkhart Motor Car Co., of Elkhart, Ind., finally admitted insolvency, the last has not yet been heard of the case. The trustee in bankruptcy is bent on upsetting a transfer of property to the Elmer Automobile Corporation, which preceded the difficulties.

It will be recalled that previous to the filing of the petition the stockholders of the company held a meeting at which they passed a resolution setting forth that they were insolvent, and unable to pay their debts, and that an inventory of the personal property disclosed assets to the value of about \$11,000, which personal property by the same resolution they agreed to dispose of to the then embryonic Elmer Auto Corporation whose 90-day notes the Elkhart stockholders agreed to accept. The Elmer was capitalized with \$700,000 in capital stock, and the property was transferred. The notes of the Elmer corporation, however, proved worthless, all of them subsequently going to protest.

When G. R. Sawyer was appointed trustee for the Elkhart Motor Car Co., he stated that he found absolutely no assets and having become convinced that the transfer of the personal property to the Elmer Auto Corporation was irregular, he has drafted a complaint which asks the United States District Court in equity to set aside the transfer and declare it fraudulent and void, as against the creditors of the Elkhart Motor Car Co. In this complaint Trustee Sawyer has joined all of the directors of the Elmer corporation as parties defendant, alleging a conspiracy between them to defraud the creditors of the Elkhart Motor Car Co. The Elmer corporation was formed by H. H. Elmer, former general manager of the Haynes Automobile Co., of Kokomo, Ind., and several others identified with the Haynes establishment.

Monthly Auctions in Indianapolis.

No less than seventy second-hand automobiles went under the hammer at Indianapolis's first auction sale of used cars, which took place last week at the Delaware Garage. They ranged all the way from six years of age to mere "yearlings" and varied in price from \$75 to \$1,000. All of the cars were run out of the building under their own power and demonstrated before the bidding started. It is contemplated to make these auction sales monthly affairs, as no less than 200 rural would-be purchasers attended the sale, and brisk buying was a feature of the sale.

WHY MUNICIPAL CARS COME HIGH

Dispute Between Minneapolis Garagemen Brings Out Sensational Charges—Cars "Doctored" to Promote Repairs.

An interesting sidelight upon the peculiar fact that municipally-owned automobiles are more expensive in up-keep than privately owned cars has been thrown by accusations made by T. D. Schall, of Minneapolis, Minn., as the outcome of disputes which have arisen in the Automobile Owners' Association's garage. It seems that one M. C. Hickcox, who had considerable political "pull," succeeded in getting

own "recipe." The officers of the association then filed charges against Hickcox and asked that the contract be taken from him and turned over to the association, which would guarantee honest repairs; they declared that the company had been formed on the strength of Hickcox's contract and that the taking away of the contract due to his alleged "fake repairs," had cost them over \$2,000.

Fly's \$15,000 Suit Shrank to \$25 Verdict.

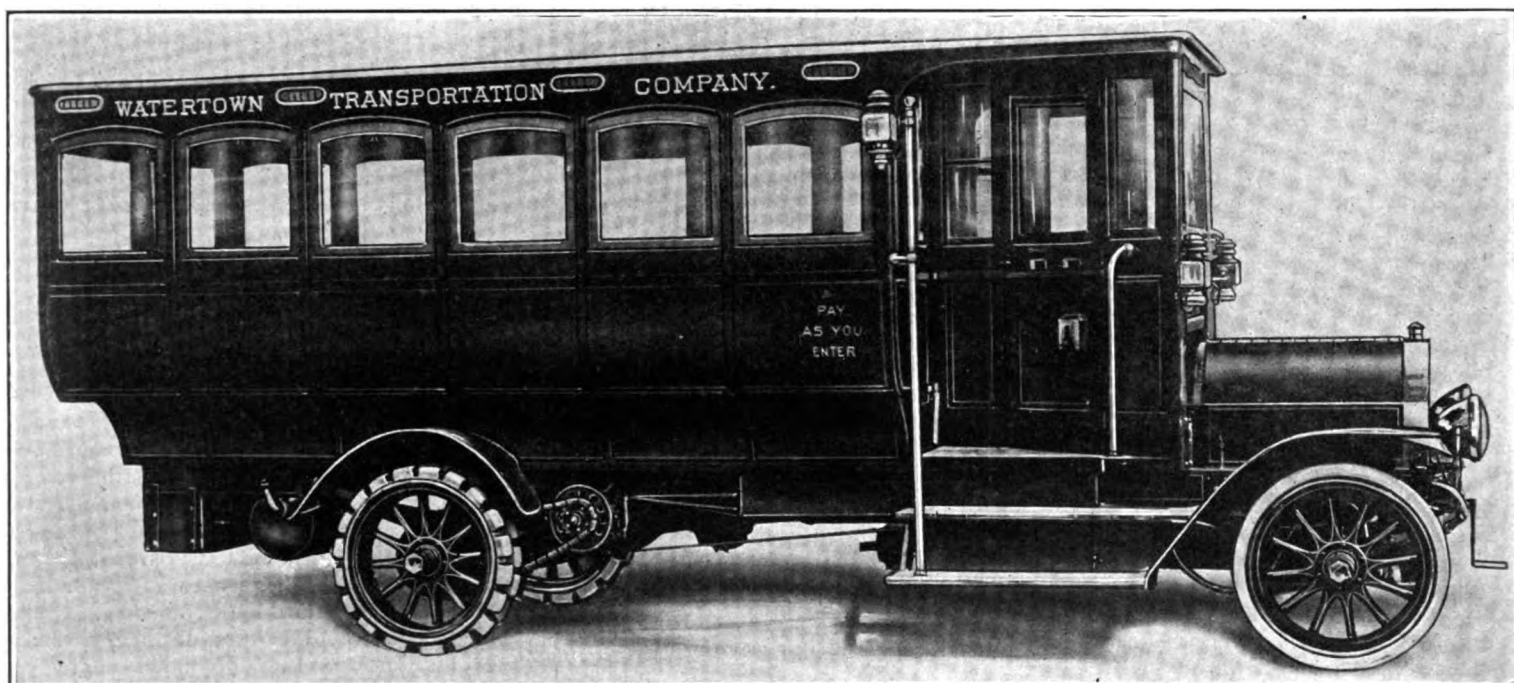
When Fred Fly heard the foreman of the jury in his damage suit for \$15,000 against the National Motor Vehicle Co., of Indianapolis, Ind., declare that it had agreed on a verdict, he dreamed of a rosy future with nothing to do but to spend the thousands

BIG SHIPMENTS TO FOREIGN PORTS

Australian Orders Responsible for Large Cargo and a Trainload of Automobiles —Farmers' Supply Co. Takes 40.

What is said to be the biggest shipment of motor cars ever exported to a single destination, left New York on December 20th, for Adelaide, South Australia, via the steamer Schoenfels, consigned by the United States Motor Co. to the Farmers' and Producers' Supply Co. No less than 75 of the cars were Maxwells, 40 of them being sent to fill a single cabled order. The shipment included a number of Columbias,

KNOX "PAY-AS-YOU-ENTER" OMNIBUS PRODUCED FOR SERVICE IN NEW YORK STATE



the contract for storing and repairing the various motor cars owned by the city of Minneapolis. For a substantial consideration, and on condition that he be appointed manager of the association's garage, Hickcox transferred the contract to the so-called Owners' Association.

Everything then progressed smoothly until T. D. Schall, an officer and incorporator of the association, discovered something wrong in the repair work done for the city. In charges filed with the city council last week, he declares that Hickcox ordered city cars repaired in such a manner that they would break down in a short time, so that he might be able to collect another repair bill. As a result of the row in the ranks of the association Hickcox "resigned" the management of the garage. He took the repair contract with him, formed a new company with Fred Blackmar and C. N. Acker, and continued to repair municipal automobiles according to his

that were going to be his. But his dreams came to an abrupt halt at the next words—"we award him damages in the amount of \$25"—which seemed malicious perfidy, after that self-same jury had been deliberating 23 hours over the three days' testimony offered by both sides. Fly claimed to have been struck by one of the National company's test cars and permanently injured.

Tire Repair Tariff That Holds Customers.

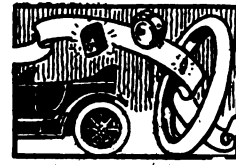
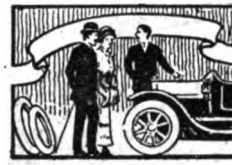
With true Yankee shrewdness, the Alling Rubber Co., which conducts a chain of stores in New England, has evolved a tire repair tariff which adroitly makes continued patronage profitable. For instance, for the first tube repair the Alling charge is 50 cents, for the second and subsequent repairs on the same tire the charge is 25 cents. Similarly for surface covering patches, the first charge is 75 cents, while the second patch on the same tire costs 50 cents, and the third patch but 25 cents.

Stoddard-Daytons and Brush runabouts.

Another big shipment was that of the Willys-Overland Co., of Toledo, O., which last week shipped 90 "knocked down" and crated Overland cars in a single 30-car trainload, all the machines being for export, Australia taking the largest single lot, 33, and others being tagged for New Zealand, Tasmania, South Africa, Brazil, Holland, Porto Rico, Uruguay, Peru, England and the Philippines.

Where Tradesmen Loan Cars Freely.

The extent to which automobiles are loaned on public occasions has reached remarkable proportions in Indianapolis. On the occasion of the recent visit of Western governors, for instance, the local manufacturers and dealers supplied no less than 71 cars for the use of the governors and their escorts. The cars were loaned by 18 members of the Indianapolis Automobile Trade Association.



Charles Guggenman has opened a garage at St. Paul, Neb. He will handle Hudson cars.

The Rantz Motor Car Co., of Bridgeport, Conn., has filed a certificate of dissolution.

W. R. Holloway has opened a salesroom at Collins, Miss. He pins his faith to the Cole "30."

L. A. Tinnes has opened salesrooms at Bird Island, Minn., where he will display the Overland line.

Louis Keller & Son are building a brick garage at the corner of Fifth and Bloom streets, Louisville, Ky.

The Overland Automobile Co., of San Antonio, Tex., has been dissolved by mutual agreement of the partners.

Henry Johnson has purchased the Culver Garage, at Pomeroy, Ia. He will continue the business under the old style.

Churchill & Hayford is the style of a new concern which has "opened up" at Bucksport, Me. It has established itself in the J. H. Hill building.

S. Hagge, a salesman of Andover, Ia., has gone into the automobile business. He is building a garage at that place, where he will display Michigan cars.

The Hollander Motor Car Co. has opened new salesrooms at Boylston street and Massachusetts avenue, Boston, Mass. The company handles the Metz car.

The Richmond Motor Co., which for some time has operated a garage in Richmond, Va., has gone into the sales business. It will be the agent for Everitt cars.

J. W. Laughlin, who formerly was connected with the Rambler agency at Toledo, Ohio, has gone into business on his own account and opened an accessories store in that city.

At an estimated cost of \$3,000, V. I. Whisten is building a one-story garage at Eighth avenue and 142d street, New York. It will be 25 x 96 feet, of brick and fire-proof construction.

R. L. and H. H. Smith, who handled the Selden line in Boston, Mass., have switched over to the truck business and opened salesrooms at 1008 Commonwealth avenue. They will feature the Mais truck.

Mahlon W. Newton is laying ambitious plans for a new garage, two stories high, to be erected for him on Ventnor street, Philadelphia, Pa. It will be 120 x 63 feet and will cost more than \$15,000.

H. E. Throne is remodeling the lower story of the Michigan building, at the corner of Madison and Michigan streets, To-

ledo, Ohio, for an automobile salesroom. He will display the Mitchell line.

The Big Cedar Auto Co., of Osage, Ia., has been formed by consolidation of the West End Garage, owned by Ben Colton, and the garage of B. K. McNay. Ford and Overland cars will be handled.

Pipher Brothers & Austin, dealers in second-hand cars in Los Angeles, Cal., have taken on the sale of new cars. They have opened salesrooms on South Main street, where they will display Cutting cars.

The co-partnership of Alfred J. Walker, Stoops & Co., 218-220 West 64th Street, New York, has been dissolved. The automobile and carriage building business will be continued by Alfred J. Walker & Co.

W. H. Starbuck and J. C. Mattice have opened salesrooms on Fairfield avenue, Bridgeport, Conn., where they will handle Ford cars. Both men previously were connected with the Ford branch in New York.

Ralph P. White, who has been working as an automobile salesman in Youngstown, Ohio, has gone into business on his own account and opened a salesroom in that city. He will handle the Cole line of cars.

J. E. Ullman, of Des Moines, Ia., has opened salesrooms at the corner of Mulberry and Eleventh streets, where he will exhibit Ohio cars. He will do business under the style the Ohio Motor Sales Co.

The Haynes Auto Sales Co., of Los Angeles, Cal., has moved into new and more commodious quarters at 1225 South Olive street, where both Haynes and Krit cars will be shown. H. Brotherton is the manager.

George Koogle, of Findlay, Ohio, has purchased the Main Garage, located on North Main street in the Ohio town, from Earl Myers. He will continue the business under a different name, which has not yet been chosen.

Bruce & Co., who operated a garage in Milton, Ia., have branched out and invaded Bloomfield, in the same State. Their new garage is of cement blocks and occupies the most prominent corner of Bloomfield's central square.

E. W. K'Burg and L. L. Blood have moved their salesrooms to 819 Madison street, Toledo, Ohio, until their new building on Madison avenue, between Tenth and Eleventh streets, is completed. They handle the R-C-H line.

C. M. Storm has opened salesrooms at 1012 Fourteenth street, N. W., Washington, D. C., where he will display Hudson cars. The Hudson line formerly was handled by H. B. Leary, Jr., who has relinquished the agency.

P. Gadbois & Co., of Montreal, and the automobile department of P. T. Legare, of Quebec, Can., have consolidated under the style Legare-Gadbois Automobile, Ltd. The company is capitalized at \$100,000, and is headed by P. T. Legare.

The Pathfinder Motor Car Co. is the style of a new concern which has leased the building at Pico and Hill streets, Los Angeles, Cal., formerly occupied by the Los Angeles Motor Car Co. The company will handle Parry and Speedwell cars.

J. H. Boggess has sold his interest in the Gifford & Boggess Garage Co., at Griswold, Ia., to the Gifford brothers, who will continue the business under the style Gifford Brothers Auto Co. Boggess has purchased a half interest in the Lewis Milling Co., in the same city.

What is claimed to be one of the finest automobile salesrooms in New Jersey is in course of construction at 372 Central avenue, Newark, N. J. It will be 75 x 75 feet, and will be devoted exclusively to the sale of Crow-Elkhart cars, which are handled in Newark by the Lenox Motor Car Co.

The Power City Auto Co., which was composed of R. Osborn, H. A. Wetmore and Ben Churchyard, and which conducted a garage at Sioux Falls, S. Dak., has been dissolved. The business will be conducted in the future under the style Churchyard & Wetmore, at 225 North Phillips avenue.

The Linscott Supply Co., which has opened a salesroom at 161 Columbus avenue, Boston, Mass., is the old Boston Cycle & Sundry Co. under a new name. The gradual predominance of automobile accessories among the goods handled by the firm caused the change of name to be made simultaneously with the opening of the new establishment.

The Cleveland Rubber & Supply Co. has established a service department at 2352 Euclid avenue, Cleveland, O. The building will be open day and night for the especial benefit of motor trucks, and will have as special feature a large room stocked with various sizes of reserve wheels, shod with Swinehart tires and ready for instant use on any of the trucks in use in Cleveland.

Under the style Southwestern Cole Motor Co., a new concern has been formed at Dallas, Texas. It will distribute Cole cars in the largest part of Texas, Oklahoma and Arkansas. The officers of the new company are: President, W. F. Bridwell; vice-president, W. Y. Foster; secretary-treasurer, C. B. Foster; general manager, C. F. Hurst. Bridwell and Hurst are the active men in the concern.



PENNSYLVANIA

"Guaranteed"

INNER TUBES

"No. 503"

A high grade tube sell-
ing at a moderate price

For months the Pennsylvania Rubber Company has been experimenting with the development of a genuinely serviceable automobile tube which could be sold at a reasonable price. The Pennsylvania "No. 503" is the result.

Each Tube is Guaranteed

This tube has been so thoroughly tested, is so well made and of such high quality material that it carries an unqualified season's guarantee.

Pennsylvania "No. 503" Tubes are made in the most popular selling sizes.

Persuant to the policy adopted by the Pennsylvania Rubber Company at the time of its re-organization, February 1st, 1910, we have contemplated an attractive margin of profit for the trade, in placing this tube on the market.

*Jobbers and Dealers Desiring to Sell Automobile
Inner Tubes for Profit Should Write Us.*

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(Re-organized February 1st, 1910)

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Detroit, 247 Jefferson Avenue
Minneapolis, 917 First Avenue S.

PENNSYLVANIA RUBBER CO. OF NEW YORK
New York City, 1700 Broadway

PENNSYLVANIA RUBBER CO. OF CALIFORNIA
San Francisco, 512-14 Mission Street
Los Angeles, 930 So. Main Street



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STATESMANSHIP AND FEDERAL ROAD BUILDING.

Perhaps, as the President implied in his address at the banquet of the Automobile Club of America last week, it is unstatesman-like to urge that the Federal government lend its financial aid to the improvement of the public highways; but there will be very many who will take issue with Mr. Taft on the point.

Statesmanship has become an elastic virtue. It has become so confused with politics that it is difficult to draw a line between them. It is certain, however, that statesmanship can reach no greater height than when it performs the greatest good for the greatest number. And excepting only education and those mediums which abridge distance, if there is any means that serves more good to more people in more ways than a good road it would be interesting to have Mr. Taft or any other statesman point out what it is and wherein it lies.

As a matter of fact, a good road itself is an educator and an abridger of distance and no work in which the Nation can engage at home can bring such direct moral and physical benefits to its citizens, man, woman and child—there is no other physical agency that can add so much to human value and property values. If serving such tremendous and far-reaching purposes is not statesmanship, then statesmanship is a pretty poor article, indeed.

Undoubtedly, as the President contends, once the Federal government engages in such work there is no reckoning where the expenditure will end. But it is at that point that real statesmanship should enter and will enter; it will say and insist that the expenditures shall be within reason. Governments of other countries are engaged in the work of road building and are able to

regulate it successfully, and despite the apparent hopelessness of Mr. Taft, there are Americans who believe that the United States can as wisely cope with the problem.

Perhaps if the President struck at the "statesmanship" which distributes millions in garden seeds, still more millions in pulling snags from useless creeks and in erecting public buildings in cross-roads towns, and many more millions in supplying "easy money" to thousands of able-bodied and not impoverished patriots who fought for the love of country, but who are not now too patriotic to refuse payment for such love—if the President struck more stoutly at these expenditures and at the "statesmanship" that permits them, probably he would strike a more responsive chord than he struck when he placed himself in opposition to the movement for Federal aid in road building—a movement which his attitude may retard but cannot stop.

NOT A BLOW AT THE HONEST GARAGEMAN.

Quick to appreciate its force, the National Highways Protective Society has adopted the Motor World's suggestion as its own and has announced that it will seek to have the New York law so amended that the garage owner or superintendent or both shall be made accessories to the crime popularly styled "joy riding"—the unauthorized use of cars by chauffeurs and garage employees.

While it may be desirable that a more thoroughly representative organization espouse the cause, help from any source is better than no help at all and the Society's assistance, therefore, is not to be despised. Such an amendment to the law will not be easy of passage, but if it is passed, it will, as the Motor World said in advocating it, put an end to "joy riding" as quickly and as effectively as a similar law put an end to racetrack gambling when all other means failed.

Our dear old friend, the Horseless Age, thinks the law would prove "a blow at garagemen." And it undoubtedly would prove a blow at garagemen of a certain kind—the kind who deserve the blow, the kind who conduct their establishments in the interests of the chauffeur instead of in the interests of the car-owner, who pays both for honest service which he does not receive. The other sort of garageman has no need to fear such a law. The Horseless Age's solicitude for the garage owner who may be deceived by a chauffeur or whose garage may be forcibly entered is unnecessary. The law amply would safeguard such men.

Such instances, however, are comparatively rare. In not one case in a hundred can a car be removed from a garage without the knowledge or consent of the garage owner or his representative. Anyone who holds to the contrary, if he lacks personal information, can readily be undeceived if he is but able to obtain the confidence of anyone engaged in the business.

"Joy riding" simply cannot exist without the connivance or blinking of the garagemen, and they know it only too well. They are, by their connivance or complaisance, abettors of the crime—and since they will not realize the truth and apply the remedy, public interest and trade interest requires that they be held responsible parties for the odium, the injuries, the loss of life and the property damage which the commission of the crime entails.

The car-owner is the basis of the whole industry. Anything that affects him affects the industry. "Joy riding" does affect him and seriously. Wipe out the cause and the effect is eliminated. The way to eliminate both is to hold the garageman to strict accountability. If he conducts his garage as it should be conducted the proposed law will affect him not at all.



Hannibal, Mo.—Long Silent Motor Co., under Missouri laws, with \$12,000 capital. Corporators—Elmer C. Long, Frank R. Tate, Theo. Moreno.

Milwaukee, Wis.—Auto Starter Co., under Wisconsin laws, with \$1,000 capital. Corporators—J. D. Babcock, James T. Drought, Oscar Fricledick.

Ashtabula, Ohio—High Level Auto Co., under the laws of Ohio, with a capital of \$10,000; to deal in automobiles. Corporators—J. C. Topper and others.

Syracuse, N. Y.—The Julian Motor Co., under New York laws, with a capital of \$200,000; to deal in automobiles. Corporators—Julian S. Brown and others.

Chicago, Ill.—Hoof Bros. Co., under Illinois laws, with \$5,000 capital; to deal in automobile supplies. Corporators—Harry Hoof, Alma C. Hoof, George B. Hoof.

Omaha, Neb.—Omaha-Auburn Co., under Indiana laws, with \$10,000 capital; to deal in automobiles. Corporators—Charles Eckhart, F. E. Eckhart, Morris Eckhart.

Hattiesburg, Miss.—Hattiesburg Automobile & Machine Co., under Mississippi laws, with a capital of \$50,000. Corporators—H. S. Buescher, R. R. Boykin, M. D. Fohey.

Kansas City, Mo.—Kansas City-Auburn Co., under Indiana laws, with \$10,000 capital; to deal in motor trucks. Corporators—Charles Eckhart, F. E. Eckhart, Morris Eckhart.

Quincy, Ill.—Quincy Motor Co., under Illinois laws, with \$5,000 capital; to deal in automobiles. Corporators—Carl Becker, John Weisenborn, D. F. Hunsacker, Thomas Quinlan.

Pittsburgh, Pa.—The Kowalsky Motor Co., under Pennsylvania laws, with a capital of \$15,000; to deal in automobiles. Corporators—W. K. Stanley, W. P. Anderson and J. T. Anderson.

Chicago, Ill.—Garfield Park Automobile Garage Co., under Illinois laws, with \$5,000 capital; to deal in automobiles and accessories. Corporators—H. E. Halbert, A. F. W. Siebel, Augustus Binswanger.

Des Moines, Iowa—Interstate Auto and Supply Co., under Iowa laws, with \$25,000 capital, to deal in automobiles and supplies. Corporators—H. B. Groves, George O. Jameson and James B. Groves.

Roanoke, Va.—Roanoke Motor Car Co., Inc., under Virginia laws, with \$25,000 capital; to deal in automobiles and other motor vehicles. Corporators—Frank Welch, Sr., J. E. Shickle, Frank Welch, Jr.

Wilmington, Del.—The American Tire and Rubber Mfg. Co., under the laws of

Delaware, with a capital of \$1,500,000. Corporators—G. G. Steigler, G. D. Hopkins and G. W. Dillham, of Delaware.

Moncton, N. B.—The International Automobile Co., under Canadian laws, with \$50,000 capital; to deal in automobiles and other motor vehicles. Corporators—R. C. Bacon, F. L. Crandall and others.

Omaha, Neb.—Drummond Motor Co., under Nebraska laws, with a capital of \$50,000; to manufacture motor cars. Corporators—W. R. Drummond, James Drummond, W. B. Hughes and L. W. Scheibel.

Chicago, Ill.—Perfection Auto Tire Co., under Illinois laws, with a capital of \$15,000; to manufacture automobile parts and appliances. Corporators—R. E. Cruzon, Geo. R. Cruzon and D. C. Hutchins.

Huntingdon, N. Y.—Cook Barstel Brown Co., under New York laws, with \$4,000 capital; to deal in automobiles and other motor vehicles. Corporators—Thomas J. Cook, Frederick J. Barstel, Edward J. Brown, Jr.

Springfield, Mass.—Morse-Readio Auto Co., under Massachusetts laws, with a capital of \$150,000, to deal in automobiles and operate a garage. Corporators—George U. Readio, Glenn E. Morse, Edward M. White.

Cleveland, Ohio—Brooks-Norton Motor Sales Co., under Ohio laws, with a capital of \$10,000; to deal in automobiles and accessories. Corporators—W. K. Stanley, C. L. Norton, H. N. Pettibone and P. L. A. Leighley.

Chicago, Ill.—Parkway Garage and Auto Supply Co., under Illinois laws, with \$10,000 capital; to deal in automobiles and maintain a garage. Corporators—Walter M. Groves, Charles P. Molthrop, Louis Thorsen.

Canton, Ohio—Stark Auto Co., under Ohio laws, with \$20,000 capital; to deal in automobiles and other motor vehicles. Corporators—J. W. H. Burgener, Thomas F. Huth, Samuel Harney, George Shaffer, H. C. Ellsworth.

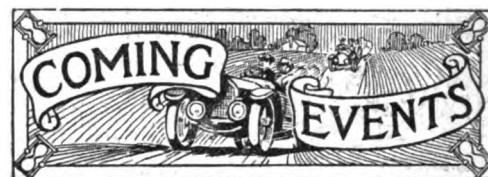
Hamilton, Ohio—Columbia Vehicle Co., under Ohio laws, with \$15,000 capital; to manufacture and deal in motor vehicles. Corporators—George W. Platt, M. M. Dermody, E. F. Alexter, Samuel Zielonski, Josephine Woon.

Helena, Mont.—Montana Auto Co., under Montana laws, with \$25,000 capital; to deal in automobiles and motor vehicles. Corporators—C. S. Caird, F. G. Benson, George Baxter, H. S. Benson, R. J. Benson, George F. Carpenter.

Warrensville, Ohio—Prince Motor Car Co., under Ohio laws, with \$200,000 capital; to manufacture and deal in automobiles and motor vehicles. Corporators—W. F. Kehnes, Thomas J. Atkinson, John G. Schult, E. B. Hecker, J. A. Hecker.

Increases of Capital.

Hastings, Mich.—Hastings Motor Shaft Co., increased from \$50,000 to \$75,000.



December 30-January 6, Buffalo, N. Y.—Buffalo Automobile Trade Association's annual show in 74th Regiment Armory.

January 2-10, New York City, N. Y.—Importers' salon at Hotel Astor.

January 6-13, New York City—Automobile Board of Trade's 12th annual show in Madison Square Garden. Pleasure vehicles only.

January 9, New York City, N. Y.—Automobile Board of Trade annual meeting.

January 10, New York City, N. Y.—Motor and Accessory Manufacturers annual meeting.

January 10-13, Peoria, Ill.—Peoria Automobile Club's show in the Coliseum.

January 10-17, New York City—National Association of Automobile Manufacturers' 12th annual national show in New Grand Central palace. Pleasure and commercial vehicles.

January 11, New York City, N. Y.—Motor and Accessory Manufacturers annual banquet at Waldorf-Astoria.

January 13-19, Milwaukee, Wis.—Milwaukee Automobile Dealers' Association's annual show in Auditorium.

January 13-27, Philadelphia, Pa.—Philadelphia Automobile Trade Association's annual show in First and Third Regiment Armories.

January 15-20, Toledo, Ohio—Toledo Automobile Dealers' Association's annual show in Terminal Railway Building.

January 15-20, New York City—Automobile Board of Trade's 12th annual national show in Madison Square Garden. Commercial vehicles only.

January 18-20, New York City—Annual meeting of the Society of Automobile Engineers.

January 22-27, Providence, R. I.—Rhode Island Licensed Automobile Dealers' Association's show in the State Armory.

January 22-29, Detroit, Mich.—Detroit Automobile Dealers' Association's annual show at Wayne Garden.

January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

IMPORTERS TO START SHOW SEASON

Their Exhibition in Hotel Ball Room Opens Next Tuesday—At Least Two Novelties in Prospect.

Officially, New York's 1912 show season opens on Tuesday next, January 2d, on which date those who have been supplied with invitations, and those who have not, but are willing to produce the necessary monetary equivalent, will be permitted to tip-toe into the grand ballroom of the Hotel Astor and view there an exhibition of foreign-built automobiles. The Eighth Annual Importers' "Salon" it is styled by its sponsors, and for the second time it will be an "exclusive" show, held in more or less secluded and aristocratic surroundings.

As was the case last year, it will be essentially a "parlor" show, the appellation being double-acting in that it will be a parlor affair, both as regards its size and its environments which last year were such as to make the evening visitor in other than "open-face" clothes feel like a fish out of water. Be that as it may, however, whatever may be the short-coming of the show as regards its size, at least it will have the distinction of housing the products of six European countries.

Sixteen exhibitors have engaged space, as against the 14 who last year were represented, and they will show a total of 17 different brands of cars. The majority of them, embracing such well-known products as the Panhard-Levassor, Renault, De Dion Bouton, Benz, Fiat and Darracq, are familiar enough to metropolitan motorists, though some others such as the Daimler, Isotta, Zedel, Clement-Bayard and Napier perhaps are not. At any rate, they all will be exhibited, as they were last year, though in modified and amplified forms, and in addition there will be two newcomers staged for the first time. They are the Piccard-Pictet, which is the product of the old Swiss firm of Piccard & Pictet, which is perhaps best known by reason of the fact that it constructed the immense turbines at Niagara Falls, and the Minerva, which is a Belgian product, which incorporates a Knight engine. Messrs. Piccard & Pictet recently were licensed to manufacture sleeve valve engines under the Argyll patents which cover a single sleeve valve engine, in which the sleeve reciprocates, and also moves circumferentially backward and forward, and it is not improbable that one of these engines will be exhibited.

However, those who attend the show for the purpose of seeing new things mechanical scarcely will be disappointed, for even though the new Argyll engine is not on hand, the new Darracq engine in which a single long rotary valve displaces the usual poppet valves, will be there, and it is likely that the new Itala engine, which also boasts

rotary valves also will be on view. There will be plenty of Knight engines on hand, of course, though much of the novelty of this type of engine has worn away since their production has been taken up in earnest by several American manufacturers. The complete list of exhibitors follows:

Adams Automobile Co.—Lancia.
Benz Auto Import Co.—Benz.
Daimler Import Co.—Daimler.
De Dion Bouton Selling Branch.—De Dion Bouton.
Demarest & Co.—Bodies.
Ducasse & Co.—C. G. V. and Darracq.
Fiat Automobile Co.—Fiat.
Glentworth, C. E.—Napier.
Holbrook Co.—Bodies.
Isotta Import Co.—Isotta.
Lacroix Automobile Co., Paul—Zedel.
Clement-Bayard and Daimler.
Metallurgique Motor Co.—Metallurgique.

Minerva Auto Import Co.—Minerva.
Panhard & Levassor Auto Co.—Panhard-Levassor.
Piccard-Pictet Motor Co.—Piccard-Pictet.

Renault Freres Selling Branch.—Renault.

Sudden Death of Harlan W. Whipple.

Harlan W. Whipple, once president of the American Automobile Association, which implies that he was a figure of national importance, died suddenly on Christmas Day in Lawrence, Mass. He was calling on a friend in that city when he was stricken by an attack of heart trouble. He was 46 years of age. Whipple was prominent in the Automobile Club of America in the early 1900's, and it was this prominence that led to the election to the presidency of the A. A. A. He was a big, good-natured, lovable man, and his election was brought about largely because of the fact, and because his disposition made for peace, which at the time was seriously threatened. He was not in the full sense, an active official. He was not a speech-maker, and played but small public parts. During recent years, Mr. Whipple devoted considerable time and money to taxicab ventures. He was interested in a number of them in several different cities, and was largely instrumental in bringing about the big merger which became the Cab and Taxi Co., of New York, which failed for a large amount several months ago. Mr. Whipple divided his time between New York, Boston and Andover, Mass., in each of which he had a home. He is the second former president of the A. A. A. to die during the present month, Winthrop E. Scarritt having passed away on the 7th inst.

"Automobile College" Offers Free Repairs.

Some of the so-called automobile schools evidently are finding it difficult to obtain "patients" on which their students may practice. An Indianapolis "college," for instance, is advertising that it will repair cars free of charge.

ORDERED TIRES BY TELEPHONE

New York Crooks Make Valuable Hauls From Many Companies—Thieves in Indianapolis, Too.

Successful by reason of the very simplicity of their scheme, and the readiness of dealers in automobile tires to oblige an apparently well-to-do customer in the so-called "dull season," four clever crooks "worked" the big tire companies located on upper Broadway, New York City, to the tune of many thousands of dollars worth of shoes and inner tubes, only about \$1,000 worth of which was recovered by the police. The men, who were captured last week, and who are facing charges of grand larceny and receiving stolen goods, respectively, are: Ernest Lefoni, a chauffeur; Leo F. Wilson, of 157 West 63d street; Chauncey Connell, a dealer in automobile supplies at 1697 Broadway, and Eugene Hart, who says he is a chauffeur for Carl Schultz, the mineral water man.

The bait which the thieves held out to the dealers, was the name of H. B. Hollins, the banker of 15 Wall street. They called a firm up on the telephone, the speaker representing himself as Mr. Hollis, and ordered a new set of tires, for an intended trip to Boston. He said he would send his chauffeur around with an order and asked that the bill be forwarded to his office. Later when a chauffeur rode up with a written order the material called for was delivered.

Among the firms visited were the Republic Tire Co., the Diamond Rubber Co., the United States Tire Co., and the Swinehart Tire Co. Late Wednesday afternoon a representative of the Bradstreet Agency called on George C. Kloss, manager of the Republic Tire Co. and asked if he had received a call from a man representing himself as a chauffeur for H. B. Hollins. Kloss said he had and admitted having handed over a pair of tires valued at \$150. When he learned he had been duped, Kloss telephoned to the manager of the Swinehart company and asked if the man had called there. "He has, and he just telephoned that he's coming around for another set of tires," was the reply.

"I'll be around to meet him after I see the police," said Kloss. Policemen McGee, Evans, Fitzpatrick and Owens were hurried to the Swinehart Tire Co. They were pricing tires when Lefoni and Wilson drove up. The police charge that they presented the order for Mr. Hollins's tires. Their arrest followed.

Later the detectives obtained a clue leading to the disposal of the many tires obtained, and as a result Connell and Hart were taken into custody. The police claim that about \$1,000 worth of the stolen goods were found in their possession.

In Indianapolis, Ind., tire thieves also

have been busy during the week past. Elmer Bradshaw, a chauffeur, was arrested for burglary and grand larceny, while Lucian Wilson and William Hughes were taken into custody under a charge of receiving stolen goods. According to the police, Bradshaw stole two Goodrich tires from the garage of John C. Ruckelshaus, in Central avenue. He sold the tires to Lucian Wilson, another chauffeur, for \$5 each. Wilson sold the tires to William Hughes, another chauffeur, at 1902 North Meridian street, for \$10 each. Hughes sold the tires to a junk dealer. Junk dealer No. 1 sold them to junk dealer No. 2. The latter sold them to a downtown merchant, who is an automobile owner, for \$30. The tires wouldn't fit the merchant's automobile rims, and he sold them to another man, who is not named in the detectives' report.

This unnamed man took them to the Goodrich company's offices to sell them, and the tires were recognized by numbers on them as the property of Mr. Ruckelshaus. A second set of tires stolen by Bradshaw was also recovered after the detectives had spent a week in tracing the Ruckelshaus tires from the tire company back to the thief.

Big Verdict for Skidding Accident.

A verdict of \$12,500 was rendered last week in the Supreme Court at Mineola, L. I., in favor of Frank E. Uhler, who had filed suit against Joseph R. De Lamar, a New York mining capitalist, for injuries alleged to have been received when De Lamar's automobile ran into the wagon on which Uhler was riding. In his defense, De Lamar's chauffeur testified that the road was muddy and that his machine skidded as he was turning a corner, making the accident unavoidable. Uhler, who is a lineman in the employ of the New York Telephone Co., is unable to work at his trade, and doctors testified that his injury is permanent. Two boys who were in the wagon with Uhler, also were injured, and one of them also has brought a damage suit against De Lamar.

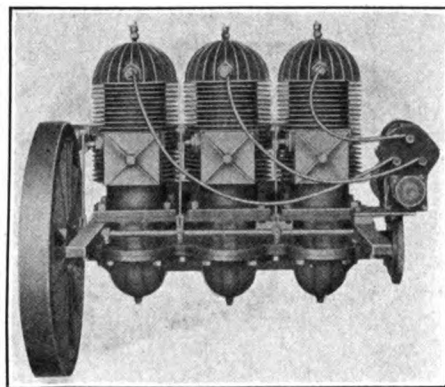
Motor Population of British Columbia.

According to the figures compiled by the provincial police department, Victoria, in proportion to population, owns a larger number of motor cars than any other city in British Columbia. Of the total of 2,365 cars registered and for which licenses have been issued, 604 are owned in Victoria or immediate vicinity, including Esquimalt, Oak Bay and Saanichton. In Vancouver, including North Vancouver, South Vancouver, Eburne and immediately adjacent territory, the number registered is 1,180 for a population of approximately 135,000 compared with 604 for Victoria's population of 55,000. Outside Victoria the island boasts of approximately 100 cars, chiefly owned in Duncan and Nanaimo. These figures include all motor vehicles, of which motor-cycles number 45.

TWO-CYCLE WITH ROTARY SHUTTER

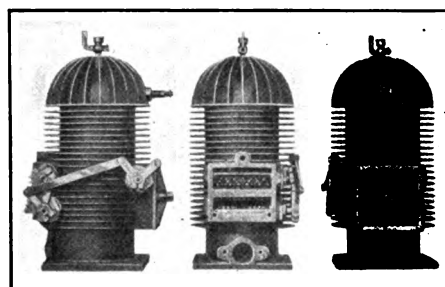
Syracuse Inventors Evolve a Radical Departure in Motors—Variable Port Areas Made Possible—Throttle Eliminated.

Though the number of two-cycle motors in use in automobiles is comparatively small, the reason, according to adherents of that type of engine, lies in lack of de-



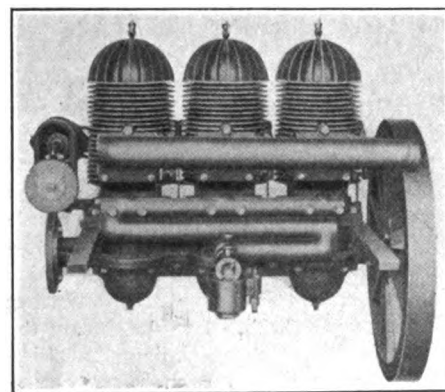
THE PALMER-MOORE ENGINE

velopment and refinement rather than in any inherent faults of the two-cycle principle. Numerous efforts have been made to



PORT OPERATING MECHANISM

eliminate the difficulties that are met when the two-cycle motor is applied to service in which great flexibility is required, and to



THE MANIFOLD SIDE

this end various double-port systems, cam-actuated valves, rotary valves and other devices have been used, some of which are giving excellent results. A new system, however, which its inventors believe will give better results in the direction of flexi-

bility and power than anything heretofore brought out, is embodied in the motor built by the Palmer-Moore Motor Co., of Syracuse, N. Y., which is shown by the accompanying illustrations.

In general, the Palmer-Moore motor is of the three-port type, having the usual exhaust, admission and transfer ports alternately covered and uncovered by the piston. The radical feature of the engine is the use of rotary shutters in the ports, by means of which the port areas can be varied and the speed of the engine regulated without causing irregular explosions or back-firing when running slowly, or loss of power at high speeds. Ordinarily a two-cycle motor built to run at high speed, having large port areas, cannot be throttled down without missing explosions and operating more or less spasmodically, while, on the other hand, an engine designed for a low speed cannot be run fast because the ports are too small to take care of the gases at much above normal speed. The problem of reconciling these contradictory conditions is the one attacked by the Palmer-Moore company. With the ports partly closed, the areas are correct for low speeds, while opening the rotary shutters increases the areas in proportion to the increase of speed, obviating the choking of the passage with gas.

The shutters are operated by means of a lever, similar to a throttle lever, placed on the steering wheel or column of the car, and in the case of a multiple-cylinder motor, which is the type now built by the company, the shutters of the different cylinders are geared and linked together so that all move exactly alike and all port openings are equal. As the shutters perform the office of the usual throttle, the carburettor is made with a fixed opening, and gas is taken to the crankcase through an unusually long manifold, the object being to obtain thorough carburation by heat.

At present but one size of motor is being built, this having three cylinders of four inches bore, and four inches stroke, and a rating of 18-horsepower. The cranks are set at 120 degrees or "thirds," and as there are three explosions every revolution of the shaft, the balance ought to be equal to that of a six-cylinder four-cycle motor. Cooling is by air, flanges being cast on the cylinders for almost its entire length. The makers state that the port arrangement is highly favorable to air-cooling and that no difficulty is experienced from over-heating. The flywheel is provided with fan-blade spokes to assist in maintaining the necessary air circulation under the hood of the car. Inspection of bearings and connecting rods is provided for by making the lower half of the crankcase removable. The system of lubrication is in keeping with the simplicity of the engine, and consists of putting oil in the gasoline tank, whence it goes to the carburettor with the gasoline, and is sprayed and carried to every working part as long as the engine runs.

WHERE FRENCH CARS CARRY FUEL

Dash Positions Most Popular but Tanks Are of Varied Sizes and Shapes—High Locations to Help Gravity Feed.

Radical changes in the body designs of motor cars might with reason be expected to affect, in greater or less degree, the dis-

might be expected to do. Judging from the accompanying illustrations, the dashboard distinctly has found favor, and particularly the corner where the dashboard and the skuttle hood come together. This is the location adopted in the Charron company's cars, as shown in 1, Fig. A. Here the tank is shaped to fit the space exactly, and its effect is that of a very deep dashboard. Very much the same idea is carried out in

Cottureau cars the position of the tank has been worked out apparently, with a view to giving the driver plenty of leg room without increasing the over-all length, as shown in 3, Fig. A, it is placed on the left side, extending practically the full height of the dashboard. In the Cottureau "double phaeton" the arrangement is different, the tank being placed close up under the overhanging skuttle; a little "utility dashboard" is placed just behind the tank to carry a lubricator and other accessories. The "deep dashboard" system is adopted by the Cottin-Desgouttes company, (5, Fig. A), in their cars having vertical dashboards; where there is a sloping footboard the tank is made larger by a triangular extension, as indicated by A. The tank proper is in front of the dash and the addition when used, is placed on the other side. Fig. A, 6, shows the capacious reservoir used in the Delage cars; this extends clear across the car in the space between the "double dashboard." Preferring to retain the tank under the seat, the Doriot, Flandrin and Parant company has lowered its carburetter and lengthened its intake manifold accordingly. The space under the dash is kept clear; the arrangement is shown in 7, Fig. A.

Another car with the tank tucked up in the corner of the skuttle is the Lorraine-Dietrich, 1, Fig. B, and a repetition of the "deep dashboard" is found in the case of the Le Gui, 2, Fig. B. The Panhard company uses a number of low tank positions with pressure feeds, but in some instances adopts the arrangement shown in 3, Fig. B. Rather than abandon the practice of

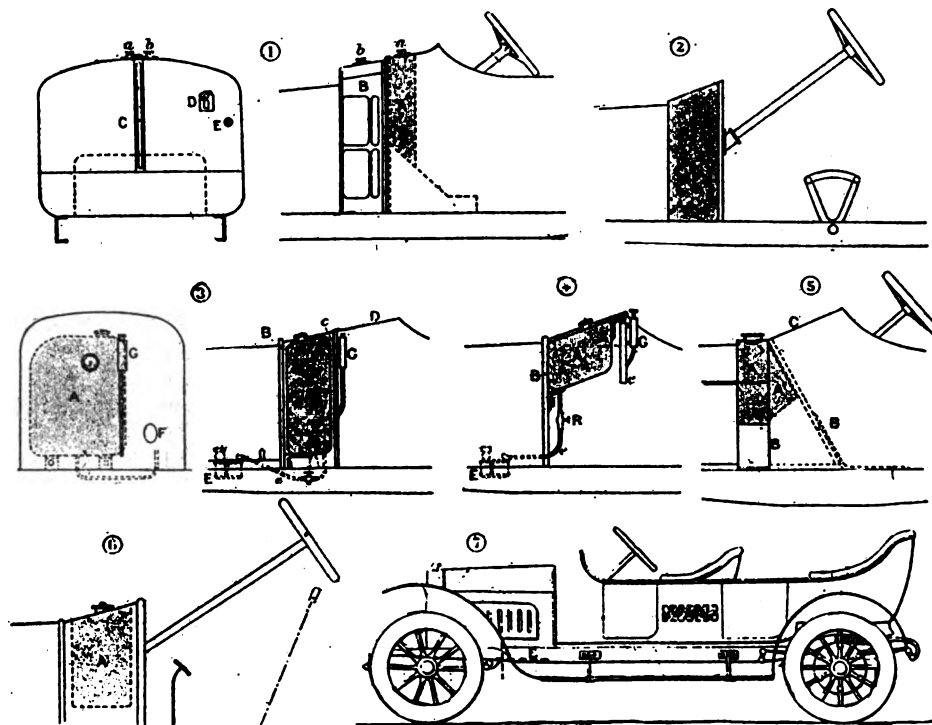


FIG. A—WHERE SOME FRENCH MAKERS LOCATE THE FUEL TANK

position of one or more of the parts accessory to the power plant; for in a unit like the automobile, in which so much mechanism is concentrated in a contracted space, it is difficult to make extensive changes in one part without affecting any others. For this reason it is interesting to examine what is probably the most radical change in body design developed in late years—the popular torpedo—to see what changes have been made necessary by the body design.

Probably the first thought to occur to the practical motorist is that the low hanging of the body with relation to the motor would make it difficult to place the gasoline tank high enough to provide sufficient "head" of fuel to feed strongly and steadily to the carburetter, especially with the car running up grade and the tank nearly empty. American cars do not seem to have experienced much trouble in this direction, but in France the case is different, possibly because bodies are hung lower and given less road clearance, and also because of a tendency to place carburetters rather high in order to reduce the length of the intake piping. Whatever may be the reason, French makers have bestirred themselves to find elevated tank locations, instead of returning to the pressure feed systems that once were so popular abroad, as they

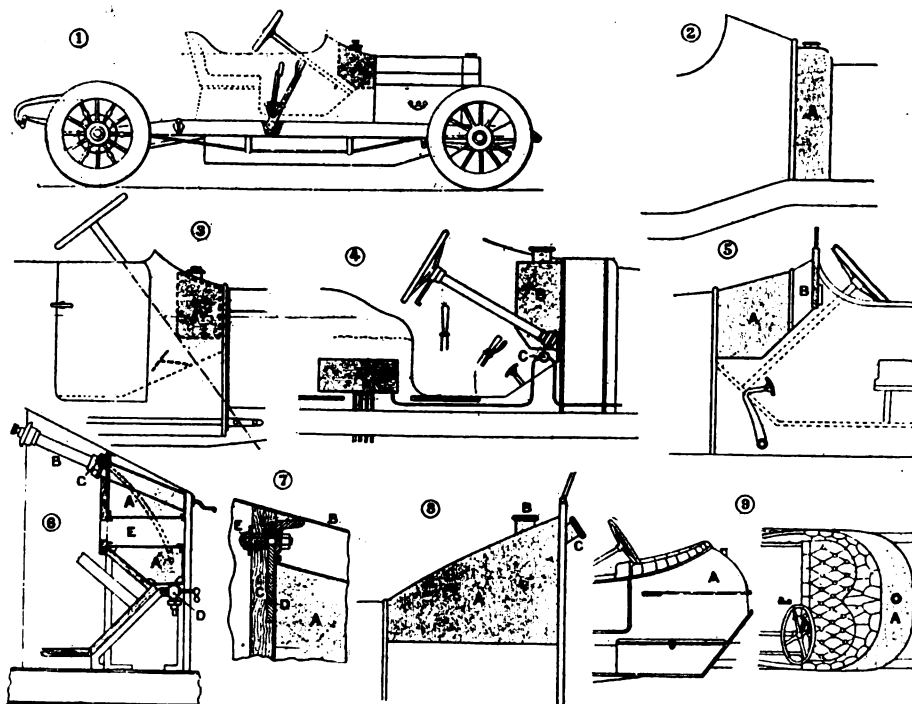


FIG. B—SOME OTHER FRENCH SKUTTLE-LOCATED GASOLINE TANKS

the Chenard-Walcker cars, 2, Fig. A; in this case, however, the tank extends clear to the footboard, which is horizontal instead of sloping as in the Charron. In the

placing the tank under the seat the Renault company has made a somewhat elaborate compromise. (See 4, Fig. B.) The low main tank cannot be expected to feed prop-

erly when the car is ascending a stiff grade, so an auxiliary tank is placed high up on the dashboard under the skuttle in cars intended for use in hilly districts, and a three-way cock permits fuel to be drawn from either at will, or shut off from both. The dashboard tank is intended for use only when the main tank refuses to feed properly on account of the grade. The Sizaire car is another example of tank location "under the eaves" of the skuttle, as in 5, Fig. B. Another case of somewhat elaborate arrangement is that of the Turcat-Mery car, shown in 6 and 7, Fig. B. The tank A can be readily removed for repairs or cleaning, and no hole in the skuttle is necessary for the filler because a pipe for the purpose is led back, as shown—a somewhat impracticable arrangement, it would seem. There is an opening, E, through the tank for the passage of ignition wiring and the piping leading to the oil and water gauges. The method of attaching the tank is shown in 7. The plan shown in 8, Fig. B, is one adopted by a French body-building firm, Pingret, Guion and Breteau. The tank, A, occupies a space in front of the dashboard and is provided with two fillers, B and C, the idea being to use the protected filler in wet weather. A suggested arrangement for two-passenger cars is shown in 8, Fig. B, the tank forming a rounded rearward extension of the back of the seat. This plan has been used in racing cars.

Aside from its height above the carburetter, there are other advantages gained by placing the fuel tank on the dashboard. It is quite well protected from accidental damage and is readily accessible for filling and inspection, and the space occupied is of little use for other purposes. The only apparent disadvantage would appear to be that, being close to the motor, leaks would be likely to permit gasoline, either liquid or in the form of vapor, to reach some place where it could become ignited.

Obstruction in the Cooling System.

Obstruction of the circulation of cooling water is sometimes caused by pieces torn from the lining of rubber hose used to make flexible connections. Often the hose is a tight fit and if the pipes upon which it is forced have sharp or rough edges there is considerable danger of scraps of rubber being torn off. To avoid such trouble see that the pipe ends are rounded off so that they cannot cut or tear the rubber.

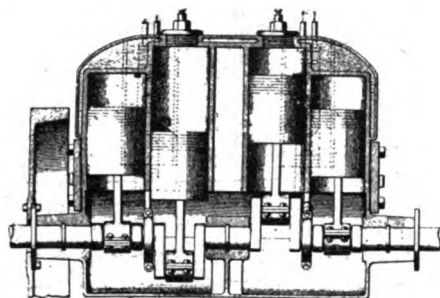
To Compensate for Shim Compression.

In taking up wear in bearings by the removal of shims it is well to bear in mind that the shims may be expected to pack together somewhat after the engine has been run for a time, occasioning a very slight looseness. While this does not always happen, it is safe to take a pull at the nuts or cap-crews that hold the bearings together after a few days' running following bearing adjustments.

MISSOURI MOTOR OF MANY PORTS

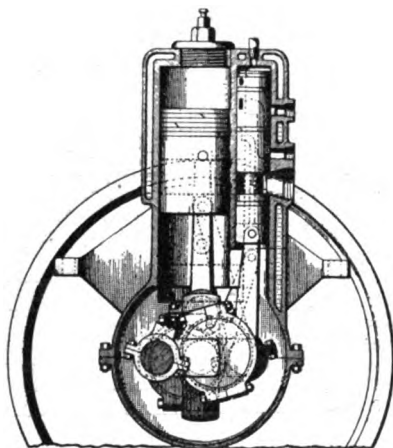
Brooks-Latta Piston-Valve Engine Proves to Be Remarkable Creation—Two Cylinders That Serve as Pumps.

With its faith pinned fast to a novel type of two-cycle gasoline motor for which numerous advantages are claimed, the Brooks-Latta Automobile Company, a recently incorporated St. Louis, Mo., con-



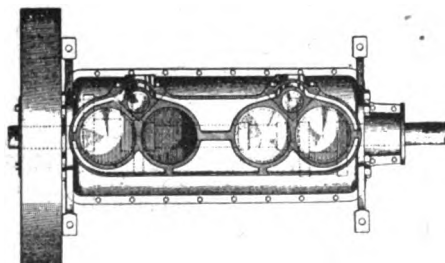
BROOKS-LATTA ENGINE

cern, is preparing to launch itself upon the stormy seas of automobile manufacturing, turning out cars to be propelled by the Brooks-Latta two-stroke motor, which will



THE VALVES IN DETAIL

be made in a factory, 135 x 168 feet, at Sullivan and Lambkin avenues which will be erected "as soon as the company has built its first demonstrating car." While the motor is termed "valveless," and one



LOCATION OF VALVES

of its points of superiority is said to be simplicity, it nevertheless possesses a piston valve for each cylinder; and for each power-producing cylinder there is a pumping cylinder of approximately the same

dimensions, both piston valves and pumps taking motion direct from the crankshaft.

First glance at the accompanying illustrations serves to create the impression that the motor has four power cylinders, but in reality the two end cylinders are pumps, communicating with the working cylinders through ports opened and closed by the piston valves, which also control ports between the pumps and the carburetter, and between the crankcase and the working cylinders.

Quite a number of different things happen during one revolution of the crankshaft. Considering only the action of one working cylinder and its accompaniments, the cycle is as follows: Assuming that there is a charge compressed in the working cylinder, the explosion takes place and the piston is driven down until, near the lowest point in the stroke, an exhaust port of the orthodox two-cycle motor type is uncovered and the burned gases escape. While the exhaust port is still open a blast of pure air from the crankcase is admitted to the working cylinder, scavenging it thoroughly. As the piston commences its up stroke and covers the exhaust port, the piston valve closes the air port and opens the port leading from the pumping cylinder, whose piston is now nearing the top of its stroke, compressing a charge of gas drawn from the carburetter on the previous down stroke. The charge, transferred from the pump to the working cylinder, is there compressed and the cycle recommences.

In addition to its numerous other functions, the piston valve may be made to do duty as an air compressor, its upper end drawing air into the top of the valve. The air so compressed is not used in the operation of the engine but is available for inflating tires, starting the motor and similar purposes.

Theoretically the motor has the advantage over the usual types of two-cycle and four-cycle motors in that the scavenging blast of air prevents the dilution of incoming fresh gas with the products of combustion from the preceding stroke, which should result in more powerful explosions and steady running, and also should prevent back-firing. It remains to be proved by actual work whether or not these advantages are offset by the extra weight entailed by this form of construction and the very considerable friction of the moving parts.

Contractor Must Pay for Wrecked Car.

Because the excavating work which T. Henry Dumary, a contractor, was doing at Albany, N. Y., had not been protected sufficiently against vehicular traffic, Allen & Arnink, automobile dealers in the New York capital, last week collected \$750 damages from him. According to the evidence presented to the jury, the excavation was poorly lighted and one of the cars owned by the dealers ran into the hole and was completely wrecked.

SINGLE CHASSIS FOR STAVER LINE

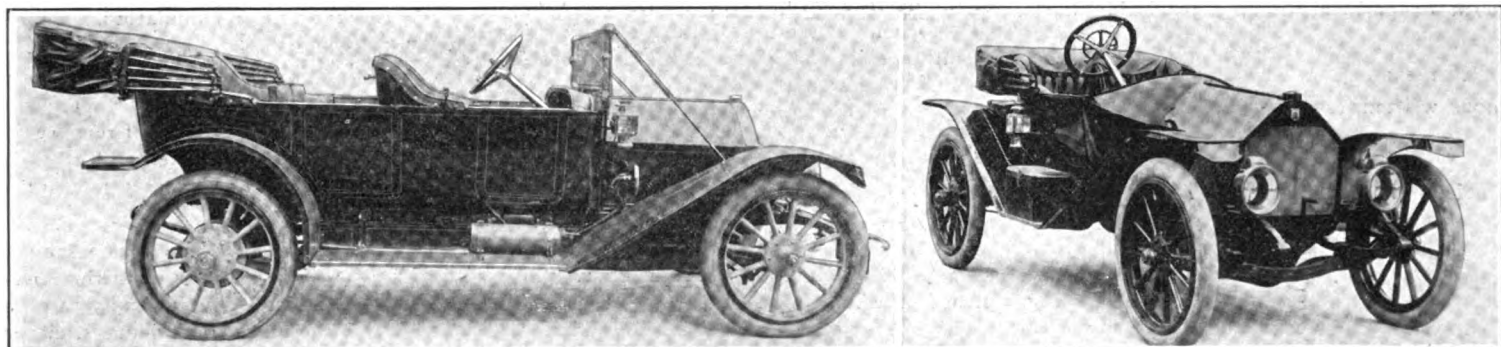
But Eleven Styles of Body and Two Sizes of Motor Afford Great Variety—Equipment Most Complete.

Abandoning the manufacture of its 30-horsepower model, the Staver Carriage Co., Chicago Ill., hereafter will confine its operations to the production of a single chassis on which will be mounted two sizes of motors, one of 35 horsepower and the other of 40 horsepower. Indicative of a full measure of confidence in the correctness of previous design, the single chassis remains practically the same as the one

voir. As the initial splash is sufficient to very nearly empty the pans, and the holes through which the oil seeps back into them are small, the amount of splash obtained in subsequent revolutions of the crankshaft is controlled and is little enough to lubricate the motor without causing smoke. The timing gears are of the helical type and are located in the crankcase proper where they receive the same lubrication as the rest of the motor.

Cooling is effected by means of a centrifugal water pump, which forces the water into the cylinder jackets in the region of the exhaust valves, whence it passes upward to a small reservoir over the cylinders and thence to the radiator. Supplementing the cooling fan, the spokes in the flywheel

senger closed front touring car, is designated as the leading car, and the completeness of its equipment leaves little to be desired. It is equipped with the 40-horsepower motor and the wheelbase is 120 inches. Tire sizes are 36 x 4 inches both front and rear, Firestone demountable rims being standard equipment. Not only is an extra rim furnished but it is fitted with a tube, shoe and cover as well. Top, speedometer and a special rain-vision windshield are included in the regular equipment, which is made even more complete by the addition of a Remy electric lighting system, embracing a combination magneto and generator, storage battery and electric side, head, tail and dash lamps. The price of the car is \$2,250.



THE 40-HORSEPOWER, SEVEN-PASSENGER STAVER AT \$2,000 AND THE \$1,650 35-HORSEPOWER ROADSTER

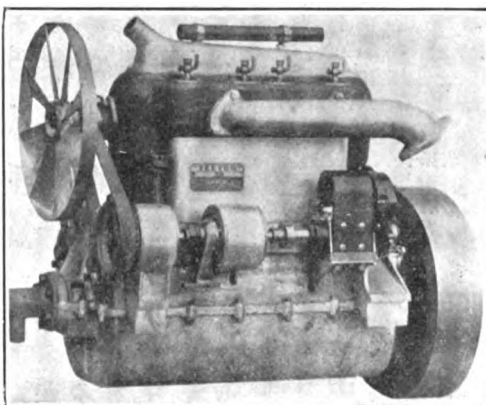
which has been used for several seasons past in the two larger Staver-Chicago cars. The various bodies, of which there are no less than 11 styles, have been changed but slightly.

The two motors are identical except as regards their bores, and in adopting the same style for both sizes, the distinctive construction embraced in casting the four cylinders in a single block with the valves on either side, has been retained. In both motors the stroke is the same, namely, 5 inches, the bore of the smaller model being $4\frac{3}{4}$ inches and that of the larger one $4\frac{1}{2}$ inches. Reducing to the minimum the number of wearing parts, the crankshaft is hung in three bearings, the total bearing surface being 12 inches. The valves are exceptionally large, measuring $2\frac{1}{2}$ inches in diameter, and the valve stems and springs are enclosed by means of removable metal cover plates.

In working out the lubrication system, due cognizance of the desirability of a "smokeless" motor has been taken, and to this end a unique constant level splash system, in which no pump is used, has been evolved. Suspended in the main crankcase there are two separate shallow pans designed to hold a certain amount of oil, which seeps into them from the reservoir in the bottom of the crankcase through a number of small holes drilled in their sides. The connecting rods dip into these pans and splash the oil over the main bearings and the cylinder walls; the oil then drains down into the crankcase reser-

voir of the motor are cast in the form of fan blades. For ignition, a dual system, embracing a high tension magneto and dry cells, is used on both motors.

The clutch is of the multiple disk variety, with 38 disks running in oil, and is housed in the flywheel, the same size, rated at 45



NEW STAVER POWER PLANT

horsepower, being used on both motors. The change gear mechanism is of the selective type and provides three speeds forward and reverse; the shafts are mounted in annular type ball bearings. The rear axle and drive mechanism is a little out of the ordinary, inasmuch as the axle housing and the torque tube are made integral, the latter member being hung to the chassis at the forward end on a cross frame member.

Model 35-F Special, which is a five-pas-

The smallest car in the line is a flush-sided "Speed Roadster," which lists at \$1,750, with the usual equipment of demountable rims, Prest-O-Lite tank, tonneau fittings, tools, pump and jack. It mounts the 35-horsepower motor and the wheelbase is 112 inches. The tire sizes may be either 34 x 4, both front and rear, or 32 x 4, at the option of the purchaser. Model 35-R is styled a "Torpedo Roadster" and is substantially the same as the "Speed Roadster"; it lists at \$1,650. Models 35-D, 35-B and 35-T, all list at \$1,650, and as their designations indicate, are of 35 horsepower; they are a full live-passenger closed front touring car, a small tonneau touring car with closed front, and an open front five-passenger touring car, respectively.

Differing from model 35-F Special only as regards equipment, which does not include either the electric lighting system, the electric lights nor the extra tire, model 35-F is a standard five-passenger closed front touring car, and lists at \$1,850. Models 40-T and 40-F both are 40-horsepower seven-passenger cars, the former being of the open front variety and listing at \$1,850, and the latter being a closed front skuttle dash type and listing at \$2,000. The tire sizes are 36 x 4 front and rear for both. Model 40-R also lists at \$2,000 and is a four-passenger racy-appearing torpedo touring car equipped with the 40-horsepower motor. The price of the limousine, complete with the usual complement of tonneau fittings and other equipment, is \$3,500; it is equipped with the 40-horsepower motor.

CHARGING THE STORAGE BATTERY

Profitable Business for Central Stations,
Suggests an Electric Light Man—In-
consistencies of Some Stations.

Deprecating the lethargy of electric light companies in general, Walter E. Rogers, who is a British electrical engineer of considerable reputation, advances the not unheard of theory that in the charging of small accumulators by central stations direct—such small accumulators as lately have become more common than ever, owing to the general adoption of electric lights for automobiles—there slumbers the germ of an exceptionally profitable business.

"In these days when so much is said, and more written, about day load for the electricity works all over the world," he says, in expounding his views in the *Electrical Review*, "it is a matter of surprise to me to find that while our chiefs are inserting advertisements for representatives to push the installation of cooking and heating appliances, etc., little or no attention is being bestowed upon a class of small day load which may be cultivated actually at the generating station with practically no outlay for mains, sub-stations, etc."

"One of my late chiefs," he continues, "did everything to discourage cells being sent to the works to be recharged, by charging for them at exorbitant and prohibitive rates, because, he said, they were a bother. Yet he would go miles to secure a five-horsepower motor consumer, and would be very sarcastic to the mains superintendent over delay in connecting a $\frac{1}{4}$ -horsepower potato peeling machine, which entailed a capital outlay of perhaps \$50 and a revenue of less than a dollar a year."

But even in cases where motorists are catered to, more or less, conditions are, in his opinion, very bad, to say the least. "Looking around such works," he continues sarcastically, "what do we find?" And proceeds to answer the propounded question himself:

"In the meter room, or shift engineer's office, there is a piece of acid-eaten and fly-besprinkled flexible cord, a corroded lamp-holder and, perhaps, one small celluloid box being charged, price 12 cents. Yet, again, I find a board equipped with batten lamp-holders and, sometimes, a quite unnecessary ampere-hour meter. I say unnecessary, because it is pretty well known that at 110 volts a 32-candlepower carbon-filament lamp takes one ampere approximately, and a 16-candlepower $\frac{1}{2}$ ampere. At higher voltages the current is proportionately lower for the same candlepower. An ammeter may be a useful adjunct to the charging outfit, but the only instrument really necessary is a portable voltmeter, reading 0 to 5, or, perhaps, 10 volts.

"In some provincial towns where I have resided, every motor engineer, garage, cycle repairer, plumber, etc., has had his own charging equipment supplied from the street mains via the shop lighting, etc.; the local station man rejoicing in the fact that he was charging a number of accumulators through lighting meters—i. e., he was obtaining six or eight cents per unit for what might rightly be considered power load. This, of course, sounds very nice, and relieves the works of all trouble and the usual row which takes place when Alderman Grouser's old battery happens to have been put on charge the wrong way round, as is invariably done sooner or later. But it does not tend to popularize electricity when the local paper comes out with an account of the destructive fire which gutted Messrs. —'s premises last night, caused by the fusing of electric wires, and the usual stock comments thereon.

"What really happens is that just as the electrician of the particular motor 'bodger' is leaving in the evening, a 10-ampere-hour battery in a celluloid case is brought in to be charged by 9 A. M. tomorrow, as the owner wants to start for Timbuctoo on his new 'Rolling Romper' at that hour. 'So please give it a good charge.' Our electrician places it on the wooden window ledge, where there are already three other similar batteries on charge adjacent to two tins of cycle oil, a curtain, and some dirty waste. To connect the battery, he takes a piece of wire, bare or insulated, it matters not, and twists it round a terminal, switches on, and bolts for his tea. Nothing happens at once, but after a time heat begins to make its presence felt at the terminal which has the twist of wire round it. This is aided by the battery being on wrong way round. From this point it is not difficult to trace the sequence of events from the time the celluloid ignites to the arrival of the fire brigade and the fusing of electric wires, etc. Another place where the first spark actually occurs is where the brass screw of a terminal is actually burned, or more often, soldered into the lead; here corrosion frequently takes place, and the terminal nut being too stiff for fingers, having learned that nuts should always be tight, we assist the coming fire by the none too gentle use of a pair of pliers.

"Since the occasional ignition of a celluloid battery appears inevitable, even when proper treatment is accorded, it being only a question of a sufficient number of cells passing through the individual's hands for one to be destroyed sooner or later, steps should be taken to minimize the damage when the conflagration has started. An old disused fire-place, provided there is a chimney, affords as convenient a charging station as can usually be found. Procure a lead-lined wooden tray, which roughly speaking, should be fan-shaped. Place the fan-handle at the back of the fireplace, the tray being horizontally propped up in front on bricks; then, with ordinary care, no dam-

age will be done to the surroundings when the flare-up comes.

"The installation of a separate meter for charging secondary cells at every charging station throughout the town, in order that energy may be sold at power rate, is objectionable. All I have written, of course, directly concerns the direct-current station only, but now that the mercury rectifier is a practical success in all but first cost, our alternating-current friends may expect to hear some more about 'fusing of electric wires.' One station in London, with which I am acquainted, commences by posting up in a conspicuous place, where a person handling a battery can read it, the following:—

NOTICE.

Recharging Accumulators.

Whilst every care is taken of batteries, the company cannot accept responsibility in regard to damage done, or defects arising in the course of recharging. The leaving of batteries for recharging is taken as an acceptance of this condition.

"I have not copied the above as a sample of English, nor can I advise upon the strict legality thereof, but I give it simply to convey a hint to the unwary, as damage, either genuine or imagined, will undoubtedly arise when any number of batteries are dealt with.

"For instance, say it is the switchboard attendant's duty to look after these cells. However much he knows about peroxide of lead, it is not right to expect that he can invariably sandwich the duties of synchronizing an alternator, just as load is coming on, with connecting up a small battery correctly as regards polarity, time and hard usage having frequently obliterated all marking on the box. So that occasionally a mistake will be made, with disastrous results as far as the particular battery is concerned. It must also be remembered that quite a lot of batteries brought in will be completely exhausted, as Mr. John Doe, whose license bears endorsement, knows nothing, and cares less, about 1.8 volts per cell as a minimum, beyond which he should not discharge.

"Having got to work and commenced to charge, one quickly discovers as gassing takes place, that the vents provided with many cells are totally inadequate and unable to pass away the gases formed. Quite 20 per cent. of the cells brought in will require filling. Here is a small difficulty, for not one cell in a hundred is designed to admit a hydrometer, or even to allow the use of a suction or pump hydrometer, by which the electrolyte is drawn into a tube, thus providing sufficient vertical height to float the instrument for ascertaining the specific gravity of the liquid. Again, many of the cells brought in in connection with portable lamps, etc., will have microscopic apertures which admit of introducing acid or water."

MARQUETTE A COMPOSITE MODEL

Blends the Best Characteristics of Welch and Rainier Cars—Remarkably Complete Equipment Made a Feature.

Boasting the retention of the best features of its ancestors, the Rainier and the Welch-Detroit, and the incorporation of a number of others which are calculated to turn the head of the most blasé purchaser, the product of the Marquette Co., Detroit, Mich., which just has made its first public appearance, is essentially a composite of those two cars. It is styled simply the Marquette and is built in two chassis sizes

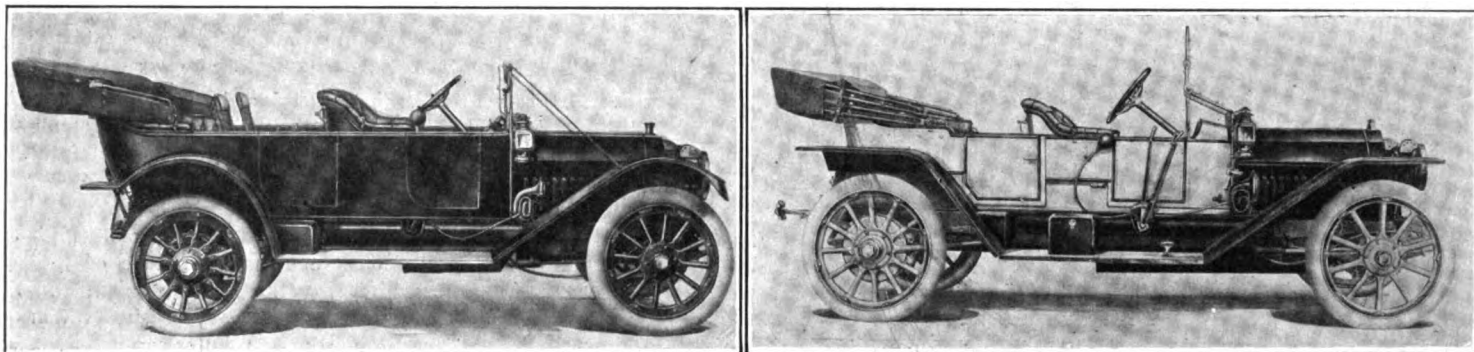
of its actual completeness. As a matter of fact, it is claimed that the price of all the cars in the Marquette line includes a more complete equipment than is furnished with any other car and the list goes far toward substantiating the claim. It includes a top with driver's curtains, a windshield, a speedometer-clock combination, a separate electric generator to furnish current for electric headlights and combination electric and oil side and tail lights which are furnished, a trunk rack, tire carriers, demountable rims, shock absorbers, horn, jack, robe and foot rails, tire repair outfit, pump and a complete set of tools.

On the 40-horsepower chassis, four body styles are regularly supplied. They are a two-passenger roadster, and four, five and

tained in the crankcase serving to maintain a constant oil level in the crankcase compartments under the connecting rod big end bearings.

From the engine, the power is transmitted to full-floating rear axles by means of leather-faced cone clutches in each chassis. The change gear mechanisms in both cases are selectively operated, four speeds ahead and reverse with direct drive on third speed being provided in the 45-horsepower chassis, and three speeds ahead and reverse being the number of changes obtainable with the smaller chassis.

Both are equipped with 36 x 4½ inch tires front and rear, the wheel base of the 45-horsepower car being 119 inches, and that of the 40-horsepower car 122 inches.



MARQUETTE CARS IN 45-HORSEPOWER, SEVEN-PASSENGER AND 40-HORSEPOWER SMALL TONNEAU FORM

in the Saginaw factory, formerly used in the production of Rainier cars. The larger of the two chassis is of 45-horsepower, and the smaller one mounts a 40-horsepower motor.

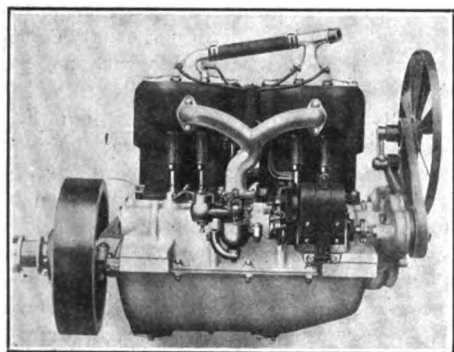
The 45-horsepower chassis mounts but a single body style. It is a roomy, seven-passenger closed front touring body which suggests not a little in general outline its

seven-passenger closed front touring bodies; on the seven-passenger car the front doors are detachable. The price of the chassis, with either of the four bodies, and including the same liberal equipment as is regularly furnished with the 45-horsepower car, is \$3,000.

As the two motors are practically identical except as regards their cylinder dimensions, a description of one suffices for both. The bore is the same in both motors, namely, five inches, the stroke in the 40-horsepower engine being five inches, and the stroke of the larger motor being 5¼ inches. Cylinders are of the T-head type and are cast in pairs with intake and exhaust gas passages cored integral. In the case of the larger motor, ignition is effected by means of two independent systems which may be used either separately or together. A Splittorf high tension magneto furnishes current for one set of plugs and a coil and battery system operates through another set. On the 40-horsepower motor the Bosch dual system is used. Except for this slight difference in ignition methods the motors are the same.

Cooling is by water, circulated by means of a centrifugal pump operated by a horizontal shaft from the timing gear train, the same shaft also serving to drive the lighting generator through the intermediary of a silent chain. The carburetter is one of the single jet float-feed type, and is hot water jacketed. For lubrication splash is relied upon, a gear driven oil pump con-

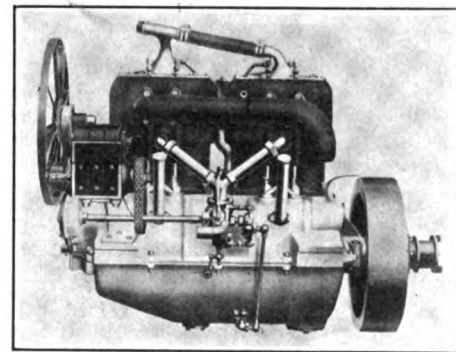
The tread is standard—56 inches—or can be increased to 60 inches at the option of the purchaser. Both sets of brakes are located on the rear wheels, one set being internal expanding and the other external contracting. Both chassis are supported in the front on semi-elliptic springs, the same type being used to support the rear of the 40-horsepower chassis. The rear



MARQUETTE 40-HORSEPOWER MOTOR

Welch-Detroit parent. The exterior is exceptionally smooth, every little projection which might tend to mar the effect having been removed; door latches and hinges are located in inconspicuous places inside and the body presents a pleasing straight-line effect which is accentuated by a low-lying top.

The price of the car with full equipment is \$4,000, though the mere statement "full equipment" in this case can give little hint



LOCATION OF LIGHTING GENERATOR

suspension of the 45-horsepower chassis embraces the use of a three-quarter platform member.

Treatment for Corroding Terminals.

Storage battery terminals that show signs of corrosion should be carefully cleaned until the last trace of it is removed, and then given a light coat of vaseline. The corrosive action of the electrolyte on metals other than lead is rapid and energetic.

GASOLINE FAMINE STILL FAR OFF

Foreign Authority Points Out New Processes of Oil Distillation—Saturated and Unsaturated Hydrocarbons.

Another reason why the automobile industry need have little immediate apprehension of the "gasoline famine" that occasionally is predicted by alarmists, is adduced by a British authority, who indicates that the rapidly growing demand for petroleum products of the lighter grades is stimulating producers to develop new processes in refining, thereby increasing the amount of fuel produced from a given quantity of the crude oil. Developments of this sort have been going on for a long time, as is pretty generally understood by those who have taken the trouble to learn that gasoline, so-called, is nothing more nor less than a mixture of various "fractions" compounded to harmonize between the producers' economical inclinations and the easy exactions of market requirements. That they tend automatically to offset the increased demand for motor fuel and the decreasing requirement for the heavier oils is a noteworthy point to consider.

"The relative importance of the various petroleum products has undergone marked changes within recent years," says the authority in question. "A large and ever increasing demand for petrol (the English equivalent for pure gasoline), accompanied by a steady decrease in the sale of burning oil and other refined products, a huge increase in the supplies of heavy oil suitable only for fuel, and in many cases a falling off in the supplies of high-grade oils of high petrol-content, have led to a state of affairs in the petroleum world which cannot be regarded as satisfactory. With the ordinary processes for oil refining an increased production of petrol is accompanied by an increase in products such as kerosene and lubricating oils, the consumption of which does not keep pace with that of petrol, and it is well known that, oil wars and price-cutting apart, considerable difficulty is being encountered in the disposal of burning oil, particularly at remunerative prices. The hopes raised of a largely increased consumption of such oil in internal combustion engines have not been fulfilled. An efficient kerosene engine possessing the flexibility and adaptable qualities of the petrol engine has, notwithstanding optimistic reports to the contrary, still to arrive. Lubricating oils, owing to the increasing use of internal combustion engines of all kinds, must now be constituted to possess physical properties different from those formerly required, and this fact necessitates changes in the refining and mixing of the constituents of natural petroleum suitable for this purpose.

"Whatever the requirements, however,

the chemical composition and physical properties of natural petroleum, as it comes from the well, remain the same, and the quantities of the various products obtainable have the same limitation, with one marked exception. If desired, the quantity of burning oil can be largely increased at the expense of the heavier oil, by means of the process known as 'cracking.'

"Processes which will be able to increase or decrease several of the constituents of petroleum, which in effect will proportion the refined products to suit market requirements, may thus be said to be commercial necessities, and recent developments have shown them to be technical possibilities also. The importance of processes of this kind must be estimated not from the little that is heard of them, oil refiners being the most secretive of people, but from the fact that they have been adopted by such important corporations as the Standard Oil Company, the Shell Transport and Trading Company, and the Burmah Oil Company. It has even been publicly announced that the Shell company has nearly completed a plant for this purpose at its Koetei refinery in Borneo.

"As in fact petrol is the key to the oil situation above described, these processes have centered round attempts to increase its proportion, but this is really only a part of the much larger business so important to oil refiners—the proportioning of all products, so far as possible without waste, in accordance with the fluctuating and ever-changing requirements of the market.

"Attempts to produce light oils from heavy ones are by no means new. As already noted, burning oil has been produced in this way for years, and numerous patents have been taken out, all proposing to increase the proportion of light oil. Many years ago processes were more or less developed in Russia for the preparation of benzene and similar bodies from still residues. . . . The results they yielded, however, were such that they could be successfully prosecuted only when the prices of the refined products were high. . . .

"The liquid products obtained have compositions which vary with the nature of the original heavy oil, but a fair average product yields in round numbers 25 per cent. of light naphtha and 35 to 40 per cent. of burning oil distillate, these being products of an oil residue containing not a trace of such valuable distillates. . . .

"The conditions under which the change from heavy to light oils is accomplished being carefully regulated, there is no difficulty in obtaining from the liquid products of a heavy oil at least 25 per cent. of light naphtha, of which 75 to 80 per cent. is salable as petrol. It is of interest to note that of the naphthas obtained in various parts of the world, that of Pennsylvania contains the largest proportion, about 50 per cent., suitable for petrol. The proportion obtained elsewhere suitable for the same purpose is very much less, being in

Scotland only 15 to 20 per cent., and averaging perhaps the world over about 25 per cent. of the total naphtha, which itself represents 4 per cent. or less of the world's petroleum production.

"The suitability of a spirit for motor fuel is generally gaged according to, amongst other things, its volatility in air, its freedom from residual spirit, and its cleanliness of combustion. For the first requirement there are well-known tests which are made on the article as ultimately put on the market. It is found that a spirit fulfilling this important condition of volatility will when fractionally distilled yield about 90 per cent. of its volume at temperatures up to 120 degrees Cent., the residue of tailings representing only 10 per cent. or less of the spirit. Hence the rule that petrol should not yield more than 9 to 10 per cent. of tailings above 120 degrees Cent. But, as already remarked, 75 per cent. of the naphtha produced from heavy oils by the new processes is classed as petrol, the spirit separated in this proportion fulfilling the above condition of volatility.

"Respecting cleanliness of combustion, it must be stated that this depends in some degree on the chemical nature of the hydrocarbons constituting the spirit, and the petrol under consideration shows marked differences from the American spirit, being similar to that produced from Scotch shale and sold in Scotland at the present time. The American spirit is mainly composed of 'saturated' hydrocarbons, whereas both the Scotch and the new spirit consist in the main of an 'unsaturated' variety known as olefines. This may be sufficiently explained by saying that the American petrol contains more hydrogen and less carbon than the new. This is not merely a matter of chemical interest, but is of significance in the practical working of a petrol engine.

"It has been established by Professor W. Bone, of Leeds University, that certain mixtures of saturated hydrocarbons containing too little air for complete combustion liberate on explosion large quantities of carbon or soot, the importance of which in a petrol engine cylinder will be recognized. On the other hand, unsaturated hydrocarbons when exploded under the same conditions do not precipitate carbon, the exhaust being gaseous and clean. Although in using both fuels care should be taken not to have the mixture too rich, there is thus a distinct advantage in favor of the unsaturated hydrocarbons when such a mixture is used. Petrol containing large proportions of the latter hydrocarbons is being successfully used for motor omnibuses in Edinburgh.

"Enough has been said to suggest that, to whatever extent the petrol demand may expand, developments are at hand which bid fair to meet it at every point and which will make the petrol 'famine' . . . well-nigh impossible—impossible, that is, so long as ample supplies of heavy oils continue to be opened up."

SPECIAL LIGHT TOP FOR "DUCKBOAT"

Speedwell Company Designs Unique Covering for Racy Roadster—Has But Two Main Supports.

It would seem not to be quite in keeping with the accepted order of things if a car so unusual as to be dubbed the "duckboat," which was launched a year ago by the Speedwell Motor Car Co. of Dayton, O., should be surmounted by something ordinary in the way of a top. But it is not, and as the accompanying illustrations show, the canopy is almost as interesting as the "duckboat" itself.

The car, which has two front seats with a passage between them by which the single rear seat is reached, is designed as a

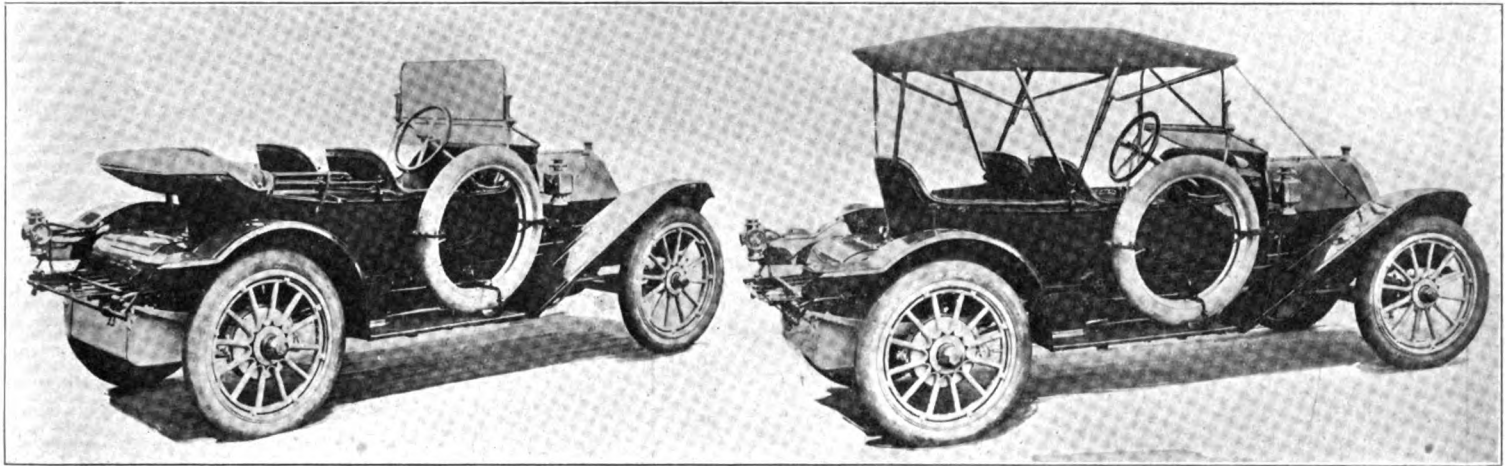
appears in the shape of the top illustrated. There are but two supports secured to the body of the car on each side, and each pair springs from a common fitting, so that they are as easy to handle as a single rod. These supports diverge as they rise, and their upper ends are a considerable distance apart. Braces from the main supports run to and support the ends of the top, and the whole is held in position by four heavy leather straps, one at each corner. By lengthening the front straps and shortening those in the rear the top can be tilted backward so as to protect the occupants from the rays of the sun coming from behind. Being light the top can be folded quickly and with little trouble; and being composed of few parts it occupies little space when folded. Altogether it seems well adapted to the class of service for which it was designed, and there would seem to be no reason why it would not

DURYEA'S FAITH IN THREE-WHEELERS

Admits the Public Will Not Buy Them But His Faith Remains—Why He Believes They Must Win.

Whoever speaks ill of three-wheel vehicles is certain to receive at least one protest—one from the veteran Charles E. Duryea—"good old Charley" Duryea. His faith in them is unwavering. He has built them and tried them, and sold a few of them, and like everyone else who has done so, his time and labor and money have gone for naught.

Duryea's three-wheelers failed or the public refused to buy them—which in the end amounts to the same thing—just as all others have failed, but despite the fact he



NOVEL, LIGHT-WEIGHT TOP DESIGNED FOR USE ON SPEEDWELL "DUCKBOAT" MODELS

speedy three-passenger roadster, and as such, a top of the usual kind would be a nuisance. The conventional touring-car top is heavy and more or less complicated, having numerous supports that must be secured to their respective fittings on the car body when the top is put up, and detached when the top is to be folded. Without considerable experience and skill, to say nothing of a fair measure of strength, it is anything but an easy task to handle an ordinary top, and a high wind greatly increases the difficulty of the operation. A light car driven at high speed causes a folded top, if heavy, to bang and flop in a manner that not only is unpleasant, but is decidedly hard on the top unless it is very securely fastened down. When the top is raised the conditions imposed by speed are as bad, if not worse than when folded. The inevitable conclusion is that a top for a speedy roadster should be as light as it is practicable to make it, and still give it sufficient area to protect the occupants of the car in rainy weather, or hot sunshine, and weight enough to resist the elements.

This series of problems was attacked by the Speedwell company, and the result ap-

pears in the shape of the top illustrated. There are but two supports secured to the body of the car on each side, and each pair springs from a common fitting, so that they are as easy to handle as a single rod. These supports diverge as they rise, and their upper ends are a considerable distance apart. Braces from the main supports run to and support the ends of the top, and the whole is held in position by four heavy leather straps, one at each corner. By lengthening the front straps and shortening those in the rear the top can be tilted backward so as to protect the occupants from the rays of the sun coming from behind. Being light the top can be folded quickly and with little trouble; and being composed of few parts it occupies little space when folded. Altogether it seems well adapted to the class of service for which it was designed, and there would seem to be no reason why it would not

Sues Bus Company for Damaged Roads.

Charging destruction of the county roads by the heavy motor buses of the Greenfield Auto-Traction Co., of Greenfield, Ind., C. C. Brattain, the road supervisor of Green township, has filed suit against the traction company. The complaint states that the buses have torn up the gravel roads to such an extent as to make them almost impassable for farmers' wagons. The company has been in operation about two months and affords the only means of general transportation between Greenfield, Pendleton and Lapel.

Sawdust That Helps Quiet Gear Noises.

One of the best means of identification of an old car is by the amount of noise issuing from the gear case. To make old gears run more silently, put about half a cupful of very fine cedar sawdust and about as much flocked graphite into the gear case with the usual amount of grease. This will not harm the gears in the least, while effectively curing the evil.

remains unconvinced. His faith remains, and his enthusiastic nature still permits him to see a future for a discredited type of vehicle, the history of which is an unbroken succession of failure, as the Motor World stated in commenting on the most recent failure, which editorial served to bring out the not unlooked-for Duryea protest. Most of the veteran's communications are of interest; his own simplified method of spelling makes them interesting when all else fails. His faith in the three-wheeler is expressed in the following verbatim letter to the Motor World:

"Your editorial on the three-wheeler has interested me. I am one of those who have been and still continue to be, believers in the three-wheeler. A long experience with them is responsible for this belief.

"All you say about the tricycl is true. The tricycl was too narrow and too short. I have some very vivid recollections of trying to ride a DeDion (bought in 1896) over our streets and getting my spine bent sideways so vigorously that I had to get off and walk. The foot propelled tricycle was a heavy affair and hard to push. That alone killed it.

"But when you come to three-wheeled autos you are in a different field. The single rear-driving three-wheeler was well worked out by the Bollees, and failed to win. The mere saving of a differential is not sufficient to make up for the other short-comings. The recent failure was rather because the Bollee experience was not used than because there is any inherent fault with three wheels. The most successful form of foot propelled tricycle was that in which the drivers carried most of the weight and the single steering wheel was in front. This holds good for the power machine. I built a number of these, and some of them are doing as good work as when put out many years ago. They were simply three-wheeled autos with one steering wheel instead of two. The front wheels were interchangeable, and this was often done. The difference was noticeable. There was no twisting or cracking of the body on rough roads. The rig seemed to have more power, due to the fact that it had less road friction. There was one less tyre to look after. In riding quality it could not be told from the four wheeler. It turned easier, took less room in the barn, had less mud guards to keep clean, was easier to get into and out of, and had less wind resistance. Was faster than the four-wheeler and preferable in many ways. But people who did not know these facts would not buy it, so I ceased to make it. I still believe that the time will come when buyers will know enough about the business to appreciate these many good features, and that it will be good business some day to put out such a vehicle.

"Your argument that only two track rigs are suitable for our roads does not hold. Probably 70 per cent. of the horse buggies sold are one horse rigs. The three-wheeler follows the single buggy anywhere. The front wheel runs in the horse path, which is where the cycle rider also rides very often. The three-wheeler will win for the same reason that the single horse buggy is popular, viz., that it costs less and is handier. When the market is ripe is for the business man to decide, and he must stick to a construction which places the load on the rear driver, and place the single steering wheel well to the front."

Motor Truck in Six-Day Delivery Test.

Emphasizing vividly the superiority of the motor truck over horse haulage a three-and-one-half-ton Alco truck, which was set to make a continuous trip of deliveries for 144 hours without once stopping the motor, finished its task Saturday night, December 23d, in splendid condition. It is stated that not once was it necessary to make adjustments to the mechanism during the six days' work.

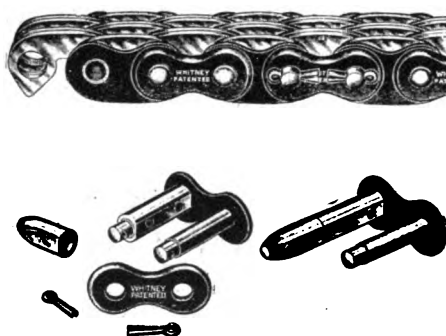
The run took place in Philadelphia during Christmas week, the truck being used by the Adams Express Co. in delivering large shipments from the main office to the branch offices, and from the shipping of-

fices to the docks and shipping terminals. The crew of the truck, consisting of driver and helper, was shifted every twelve hours. On several occasions it was found necessary to make trips out into the country, but for the most part the deliveries were confined to the business district of the city.

Speaking of the amount of work accomplished by the truck, an official of the transportation department of the express company stated that the truck, running day and night, "was more valuable than any six teams of horses we have." "While by motor," he continued, "we can haul 120,000 pounds in 24 hours, we cannot expect to haul more than 20,000 pounds with a team of horses. The truck moves three times as many goods in the same time, and works from two to three times as long."

Whitney Brings Out a "Silent" Chain.

While the "silent" chain has attained considerable prominence abroad, and



though considerable progress has been made in this country in adapting it to motor car work, it is probable that the real extent of this progress will not be known until the last automobile show is over. It is likely to be found in a number of places where heretofore spur gears have been used, including the change speed mechanism. One of several indications in that direction is contained in the fact that the Whitney Mfg. Co., of Hartford, Conn., which for several years quietly has been developing a silent chain which has been tried out by a number of automobile makers during the past twelve-month, just has placed the chain regularly on the market.

The Whitney chain, which is of Whitney quality, is of the accepted pattern; among the points of superiority claimed for it are detachability, long working life because there are four bearing surfaces for each joint, and the fact that sprocket wheels do not require grooves or flanges to prevent the chain from riding off. Detachability is secured by the use of a removable link, which can be pushed back into place without the aid of tools. The links work on hardened steel bushings which, in turn, work on hardened steel rivets, thus giving a double area of bearing surface. At the sides of the chain are guide plates which are of sufficient depth to extend over the

ends of the sprocket teeth thus preventing lateral movement. Outside plates connect together the guide plates and add to the tensile strength of the chain. The hardened steel rivets are forced into the holes in the outside plates, while the bushings are forced into the guide plates, so that the wear is divided between the rivets and the bushings, the effect being to lengthen the life of the chain considerably.

The new Whitney chain is made in various widths and in pitches varying from three-eighths of an inch to one inch. Sprocket and chain widths are made to suit the intended service.

Human Dummies and Their Parts.

There are dummies in all walks of life. Indeed, there is scarcely a profession or a trade which does not number in its ranks many such. They pass for men simply because they possess the appearance at least of men, but they are in truth only necessary parts in the mechanism of other persons' lives. They have no mind of their own to devote to their welfare; therefore, they are made to serve the interests of others. They move and act upon the word of others and they pay out their life rope length by length until the end is reached, remarks the Charleston News and Courier.

It is a surprising thing that in this day of initiative and accomplishment, when the brains of the world are matched in the struggle for existence, it is possible for such a thing as a human dummy to exist. If ever there existed at any period of the world's development the incentive to spirited action it exists to-day, and yet there are men who stand around idly waiting for some one to put thoughts into their minds and words into their mouths. It never occurs to them that the field is open to all, and that while where a dozen men succeed hundreds fail it is entirely possible for them to be among the lesser number.

Dummies are not credited with brains, however, and any appeal to their reason would prove vain. It seems as if the most that can be expected of them is absolute indifference one way or the other to the better things of life. They may as well be formed of the inanimate material of which their window models are composed for all the good they do. We have all met them at some period of our existence, and the memory is not a pleasant one. They are beyond hope for the simple reason that they have never taken the trouble to look into the future with any degree of interest or even of curiosity.

Causes of Excessive Tire Wear.

Excessive wear of front tires can, in most cases, be traced to the front wheels not being parallel when pointing ahead. Whether the cause is a bent knuckle, or steering arm, or a rod or drag link of the wrong length, or even a sprung axle, it should be found and corrected at once or tire bills will be costly.

Offsetting the Cylinder; the Theory and the Effect

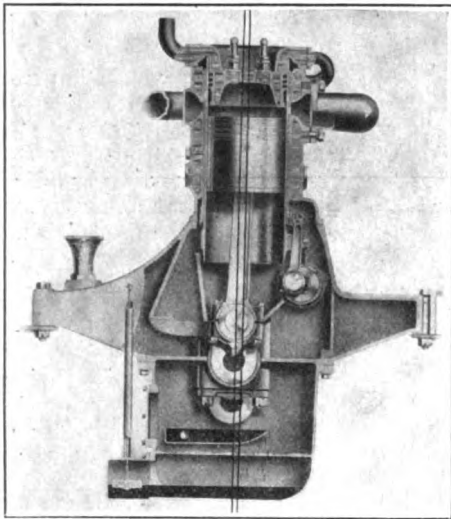
Despite the fact that of the total number of brands of automobiles on the market considerably more than half are equipped with engines in which the cylinders are offset, it is peculiar, though nevertheless true, that little if anything ever is heard of this method of construction. Few—very few—books purporting to be studies of automobile engineering in all its branches mention it at all, and what is perhaps more peculiar is that a great many manufacturers, even, whose engines are so constructed fail to mention the fact in their catalogs, or if they do so, the average layman who is looking for information must

This is the greatest offset that is used, the average of 60 engines chosen at random from among the more prominent manufacturers being $\frac{3}{8}$ of an inch.

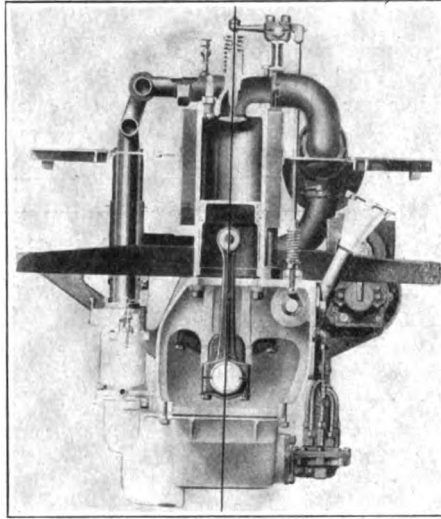
The great diversity of opinion that obtains, however, is evidenced by the following table in which the amount of offset as used in the engines of 60 cars is given:

$\frac{1}{4}$ inch.	Illinois
Kearns	Johnson
$\frac{3}{8}$ inch.	Paige-Detroit
Alpena	Penn "30"
Cadillac	Schacht
Correja	$\frac{1}{4}$ inch.
Deal	Ames
E-M-F	

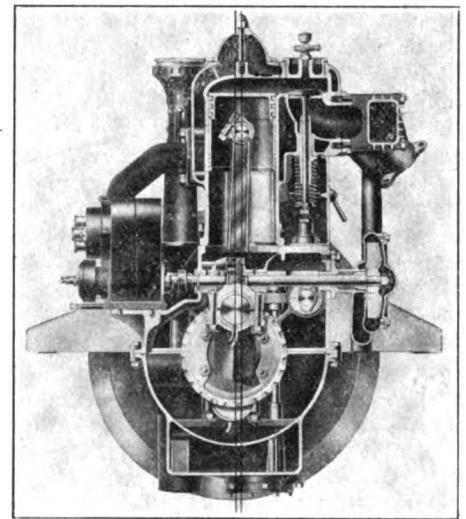
As is the case in so many other instances, it often is difficult to reconcile theory and practice, and it is therefore difficult to ascertain the exact practical advantage obtained by offsetting the cylinders. Naturally, those manufacturers who have adopted the system claim certain advantages for it, and though it stands to reason that it must have certain material advantages for the simple reason that it has been adopted and has stood the test of time, so to speak, it is nevertheless difficult to define them in exact terms. Tests have been made of both types of engines, but two engines of the same size and weight of moving parts.



COLUMBIA-KNIGHT OFFSET



FRANKLIN CENTERED CYLINDER



MARION OFFSET

needs have more than ordinarily sharp eyes to detect the reference.

Not that there is anything new about the practice; it has been in vogue almost as long as automobiles have rolled over the roads. "Desaxe" engines, the French call them, the designation meaning that the cylinders are set over a little to one side so that they are not vertically over the axis of the crankshaft, and they have steadily increased in popularity until it may perhaps surprise those who do not closely follow such things to know that of a total of 181 different makes of cars, 65 per cent. are equipped with engines in which the cylinders are offset.

Though all branches of engineering are very nearly exact sciences, it often is possible to vary certain rules slightly, or to interpret them differently. The exact amount of offset which permits of the best results therefore varies according to the experience and opinion of the designing engineer, some cylinders being offset as little as $\frac{1}{4}$ inch, and a few others being offset as much as one and one-half inches.

Flanders
Hupmobile
Lion
Locomobile
Michigan
Only
Primo
Reo
Velie
Whiting
 $\frac{7}{16}$ inch.
Marathon
 $\frac{1}{2}$ inch.
Cartercar
Chalmers
Duryea
Haynes
Jackson
Jonz
Norwalk
Palmer-Singer
Petrel
Pullman
Winton
 $\frac{9}{16}$ inches
Inter-State
Overland
 $\frac{5}{8}$ inches
Croxtton
Havers

Atlas
Auburn
Cutting
Great Western
Lexington
Matheson
Pratt-Elkhart
Republic
Zimmerman
 $\frac{3}{8}$ inch.
Carhartt
Crawford
G. J. G.
Leader
Otto
Selden
 $\frac{15}{16}$ inch.
American
1 inch.
Cunningham
Metz
 $1\frac{1}{8}$ inches.
Midland
Rambler
 $1\frac{1}{4}$ inches.
Rambler
 $1\frac{1}{2}$ inches.
Burns

one with offset cylinders and one without, never have been tested for comparative results and until they are so tested, the advantages must necessarily remain largely theoretical, though it is only fair to add that in the experience of those who have adopted the method of construction the results obtained have borne out the expectations of their designers.

Despite the unfortunate lack of accurate data necessary for a comparison of the essential characteristics of the two types of engine, however, the "desaxe" engine incorporates a number of unusual features which make it of sufficient interest to stand on its own bottom, particularly in view of its widespread popularity, and the fact that in nine cases out of the proverbial ten the average motorist does not even know that the motor in his car is so constructed; much less does he know of the theoretical side of this interesting engineering achievement.

Perhaps the most familiar example offered in explanation of the principle involved, though the statement is somewhat

paradoxical inasmuch as the example is not as familiar as it might be, is that of a man in the act of starting to pedal a bicycle: to those who have ridden bicycles, the explanation should be as clear as crystal, to use a far-fetched simile, and to those who have not it should become plain after a very little study. In brief, the example is this: When a person of even little experience starts to pedal a bicycle, the first operation is to place the pedal in such a position, just past top "dead center," that the full weight of the rider is available for the first downward stroke. Plagiarizing the idea still further, if the first downward stroke were started when the pedal was at top "dead center" the weight of the rider instead of being expended in useful energy merely would be supported on the crank bearings until the bicycle had moved forward far enough to cause the pedal to pass its highest point and start its downward travel. Consequently part of the initial energy would be wasted and the ultimate power available for turning the crank the first time decreased.

The difference between the offset cylinder engine and the example cited is that in the engine the cylinders are offset so as to cause the pistons to be in position for the first downward movement when they are at the highest point of travel. The accompanying illustrations which show three engines in section, the Franklin engine in which the cylinders are not offset, and the Columbia-Knight and Marion in both of which the cylinders are offset, illustrate the two systems. In all three pictures lines have been drawn through the center of the crankshaft, and also through the center of the pistons in order to show the amount of offset.

In the Franklin engine a single line cuts the center of both crankshaft and pistons showing that the cylinders are not offset. In the other two engines, however, the cylinders are offset, the amount being indicated by the distance between the two lines which bisect the crankshaft and the pistons respectively.

Perhaps the least known and at the same time the most noteworthy feature of the engine with offset cylinders is that its actual stroke is longer than in the ordinary engine in which the crankshaft has the same throw but in which the cylinders are not offset. This is because the pistons in an engine in which the cylinders are offset continue to travel downward after the crankshaft has completed one-half revolution from top dead center to bottom dead center. The pistons in an ordinary engine cease their downward movement the instant the crankshaft reaches bottom dead center, which is a point vertically below the center of the axis of the cylinders.

The exact amount of increase in the stroke obtained depends upon the degree of offset given the cylinders and the length of the connecting rod. This may be made plain by reverting to elementary geometry

and the axiom that the length of the hypotenuse of a triangle is less than the length of the two other sides added together. In the "desaxe" engine, to use the French designation, the distance between the wrist pin of any piston at top dead center and the center of the crankshaft is greater than the distance between the same points when the piston is at bottom dead center. The reason for this is that when the piston is at top dead center a straight line drawn from the center of the wrist pin to the center of the crankshaft represents the hypotenuse of a triangle, the other two sides of which are formed by the connecting rod and the throw of the crankshaft. When the piston is at bottom dead center, on the other hand, the line through the center of the wrist pin and the center of the crankshaft is straight. Or in other words, the distance from the wrist pin to the center of the crankshaft at top dead center is equal to the length of the connecting rod plus the length of the crank throw or the length of the connecting rod minus the length of the crank throw for bottom dead center.

Of course, the actual amount of increase is very slight, but it is an increase nevertheless, and for this reason suggests the possibility of obtaining greater power by offsetting the cylinders slightly. But the whole problem is not embraced in the mere offsetting of the cylinders; there are other considerations which cannot be overlooked, and there are those who hold the opinion that they may tend to make the practical realization of greater power by this means a conjecture.

That the firing stroke in an offset cylinder actually is greater than it is in a cylinder of the ordinary type may be realized if the crank circle be divided into degrees and the position of the piston with reference to the crankshaft be noted as it moves downward. In the offset cylinder, the firing stroke is approximately 210 degrees, varying according to the amount of offset and the length of the connecting rod, whereas in the ordinary cylinder it always is 180 degrees, or half the circle. Incidentally, the maximum velocity attained by the piston in an offset cylinder for a given crankshaft speed is slightly lower than it is in an engine in which the cylinders are not offset.

As more than half the circle is taken up for the firing stroke, less than half must be left for the exhaust and compression strokes, which therefore must be completed in a relatively short time, the piston being forced back along its return path more quickly than is the case in the ordinary engine. The reversal of motion of the piston and connecting rod therefore is quicker at bottom dead center than it is at top dead center. With the ordinary type of cylinders the reversal of motion is the same at both the top and the bottom of the stroke.

As has previously been mentioned, prob-

ably the principal feature of the offset-cylinder engine, and the feature which is "played up" most as an advantage by those who advocate the system, is the reduced angularity of the connecting rod during the middle portion of the firing stroke. One of the not altogether unnoticed features of the offset-cylinder engine is that it may be subject to supersensitiveness to ignition advances, particularly when the spark is timed to take place when the pistons are as near as possible to top dead center. This is due to the fact that at this particular point the angularity of the connecting rod is such that it is opposed to the direction of rotation in a sense. From this point, however, the angularity diminishes very rapidly.

It is just one of the difficult problems connected with the proper design of a "desaxe" engine to determine the exact amount of offset necessary so that when the full pressure of the exploded charge in the cylinders is available the pistons and the connecting rods shall be directly in line with each other.

The angularity of the connecting rod with reference to the crank throw never can be as great in an offset-cylinder engine during the first part of the firing stroke as it can in an ordinary engine. During the last part of the firing stroke, however, and during the greater part of the exhaust stroke, the angularity is considerably greater. In choosing the amount of offset it is necessary to set off the advantages of the relatively straight thrust of the connecting rod during the firing stroke against the disadvantage of increased angularity during the compression stroke in order to arrive at a value that will leave a balance in favor of the former factor.

Facts Revealed by Accident Statistics.

Statistics show that there is one accident for every 12,053 miles operated by a trolley car and one for every 178,660 miles made by an automobile, says the Engineering Record. An electric car has to travel over 800,000 miles before causing a fatal accident, and an automobile has to travel over 2,400,000 miles before being the cause of such an accident. In other words, a motor vehicle travels three times as far for each fatal accident as an electric car. When the comparison is based upon injuries, it will be seen that the automobile must travel 16 times as far as a trolley car before causing an injury. These figures apply to employees and occupants of cars. The automobile must travel three times as far as the electric car before killing an outsider, and at least seven times as far before injuring an outsider. In considering these figures it should not be forgotten that the electric always travels on its rails and everybody knows where it will appear, while an automobile has the full width of the roadway and does not have the free right of way which the electric car has when running over its tracks.

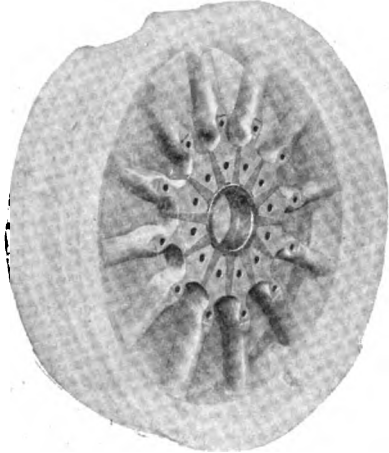
MICHELIN'S TWIN TIRE TREATMENT

Develops Both a Rim and a Wheel to Suit Requirements—How They Are Designed to Operate.

Years ago, when Andre Michelin, of the famous tire making concern bearing his name, delved very deeply into the subject and made exhaustive tests and experiments bearing on the durability of pneumatics

more rapid. If the weight is increased by even so little as five per cent. the wear on the tire will be increased about 14 per cent. Thus, as soon as the weight is in-

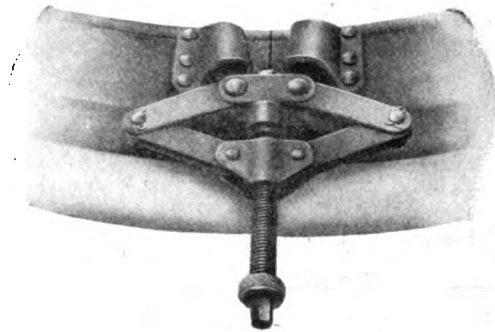
equally true that many users of trucks who have had wide experience with both solids and pneumatics, believe, with the Michelin company that the use of twin pneumatic tires offers advantages in medium and light commercial work that cannot be obtained from anything less resilient. The basis of this belief is indicated by the Michelin company's statement that twin pneumatics



SHOWING TAPERED SPOKE WEDGES AND HUB CONE

under heavy loads, one of the things he discovered very quickly was that single pneumatic tires were entirely unsuited to really heavy work.

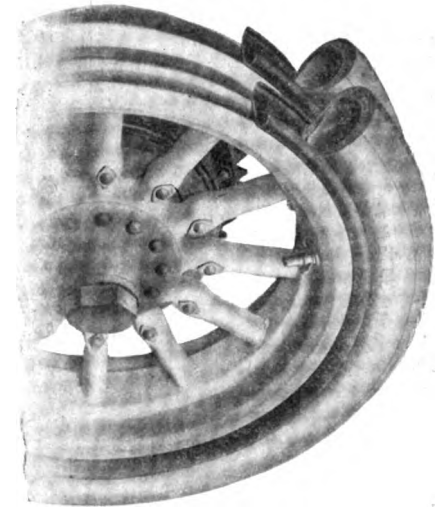
"No single pneumatic tire, even of the largest diameter, can be expected to carry a greater axle load than about 1,350 pounds," said Michelin in a speech delivered in 1908, at a meeting of the French Society of Civil



EXPANDER, AND CONTRACTED RIM

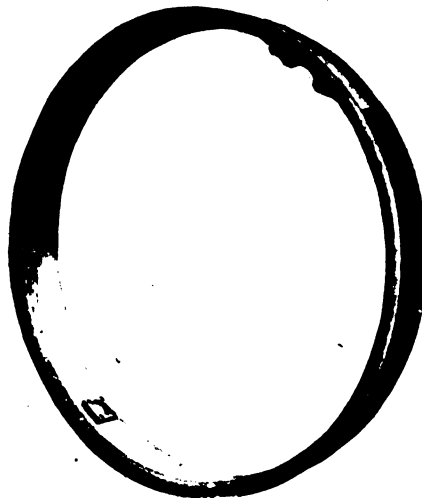
creased it is discovered that tires wear out with extreme rapidity."

With this as a beginning, the Michelin people have devoted much time to the problem of using pneumatic tires for com-



RIMS AND TIRES IN SECTION SHOWING ATTACHMENT

will outlast single pneumatics, in the same service, in the ratio of five to one, thus bearing out, in a general way at least, the contention of Andre Michelin. It is claimed, furthermore, that in addition to real and actual tire economy, there is a considerable saving in wear and tear on



THE EXPANDING RIM

mercial motor cars, and their plan, as is well known, is to use twin tires where the loads are heavy.

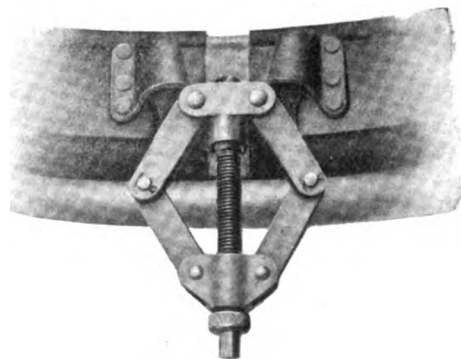
While it is undoubtedly a fact that a



METAL FELLOE WHICH REPLACES WOOD FELLOE AND RIM

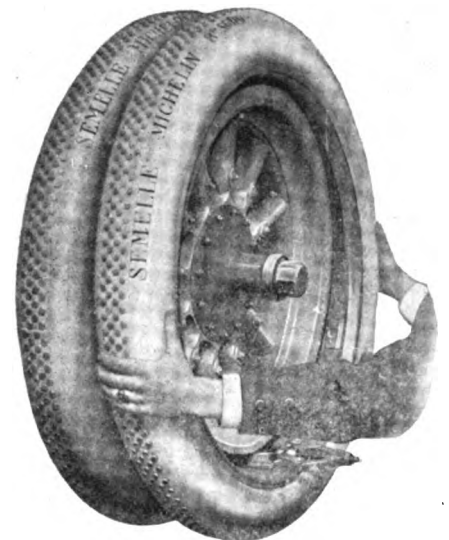
Engineers. "We have experimented to discover the relation existing between the lasting power of a tire and the weight it supports, and from the results of a great number of tests we have been able to deduce the following empiric law:

"That the mileage of a tire is inversely proportionate to the cube of the weight it supports. Thus, if the weight is doubled the wear will be approximately eight times



RIM EXPANDED FOR REMOVAL

great many manufacturers and users of automobiles, to say nothing of a certain proportion of makers of tires, still believe that pneumatic tires are entirely out of place on commercial vehicles, excepting, perhaps, those of the lightest kinds, it is



REMOVING THE TIRES

the vehicle as a whole owing to the absorption of vibration.

It is only natural that the convictions and policies of the French Michelin company should be shared by its American offspring, the Michelin Tire Co., of Milltown, N. J., which consistently has advocated the use of twin tires for commercial work, and has given American truck users the benefit

of the improvements and developments made along this line by the parent house. The most recent improvement, the latest product of the Michelin designers, is a new wheel and demountable rim for twin pneumatics of the heavy duty type.

With characteristic Michelin thoroughness, the entire wheel, which is here illustrated, has been specially designed from the hup upward. The first step was to provide means for tightening the spokes of a wheel that has "loosened up," and to this end a tapered hardened steel ring is fitted, bearing against the inner ends of the spokes and against a series of wedges placed between the ends of the spokes. When it becomes necessary to tighten up the wheel the tapered ring is driven further into the bore of the hub, forcing the spokes solidly against the felloe and at the same time setting up the wedges so as to take up all play between the spokes. Steel has been adopted in place of wood for the felloe, the company expressing the conviction that the metal is lighter, stronger and more durable than wood for this purpose.

The demountable rim, which is perhaps the most conspicuous feature of the twin tire equipment, consists essentially of a ring split at one point and arranged to be expended so that its diameter is increased for removing it from the wheel, and contracted so as to grip the felloe firmly when replaced. In order to hold the rim down on the felloe and prevent its movement under strain, each of the adjoining ends of the split rim is provided with a sheet steel socket. When the rim is in place a fastener, consisting of a pair of wedges mounted on a yoke, with a screw between them, is put in place, a wedge entering each of the pockets and the screw going into a tapped hole in a lug riveted to the felloe. When the screw is turned by means of a brace wrench the wedges are drawn into the sockets and the rim ends are drawn together with great force, the combination of screw and wedge giving enormous leverage. A recess is formed in the steel felloe to admit the fastener and the sockets into which its wedges are forced.

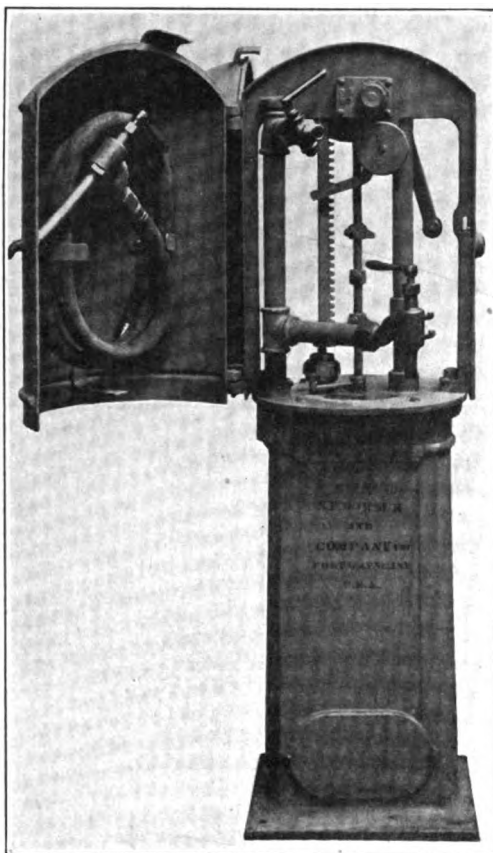
In order to remove the rim and tire the process is reversed, the fastener being removed and the ends of the rim forced apart. Considerable power is required to do this, and the necessary force is applied by means of a special tool called an expander. As the illustrations show, this consists of a set of toggle levers operated by a screw which is turned by the same brace wrench used for the fasteners. On the ends of two of the levers are short arms which are entered in the fastener sockets on the rim when the tire is to be removed. Turning the screw causes the levers to exert a powerful pressure on the rim sockets, forcing them apart until the diameter of the rim has been increased sufficiently to allow it to be removed from the wheel without further use of tools.

Circumferential movement, or creeping,

of the rim is prevented by the use of a rectangular hollow lug, riveted to the rim and extending through the felloe, through which the tire valve passes. Lateral displacement is prevented by two small rectangular blocks riveted to the rim and fitting in corresponding recesses in the felloe.

Bowser's New "Long Distance" Pump.

While gasoline is harmless enough when carefully handled, it is capable of causing a great deal of trouble if its peculiarities with regard to combustion are not re-



BOWSER "LONG-DISTANCE" PUMP

spected. This is responsible for the presence on the market of numerous gasoline storage and pumping outfits, all worked out with a view to safety from fire. Among the oldest of the concerns manufacturing such apparatus is S. F. Bowser & Co., of Fort Wayne, Ind., whose newest product just has been placed on the market—a "long distance" pump of the enclosed type—and therefore is illustrated herewith.

Intended for use out of doors, and therefore exposed to the weather, this new Bowser pump is completely enclosed in a heavy cabinet of malleable iron. It may be placed at a considerable distance from the tank from which it draws gasoline—in fact, this is usually an indispensable condition. As the base of the pump measures but 12 by 14 inches and the total height is 48 inches, the space occupied is not a serious matter.

The pump proper is made wholly of

metal and discharges through a length of special gasoline hose terminating in a filling nozzle in which is a screen of fine mesh for straining out foreign matter. An additional safeguard against the passage of impurities in the gasoline is a centrifugal filter which removes not only solid matter but also water from the liquid. A record of the amount of gasoline pumped is kept by a meter. The double swing doors of the cabinet are provided with a five-tumbler cylinder lock, so that the apparatus is practically thief-proof as well as weather-proof.

Dayton Adds "Compartment Roadster."

Solicitude for the creature comforts of those who ride in automobiles has been shown by designers for so long that new and luxurious examples of the body builder's art no longer cause surprise, however much they may be admired. But when a design appears in which special attention has been given to providing first-class—one might almost say luxurious—stowage for the motorist's touring impedimenta, a feeling akin to surprise naturally follows. This is just what the Dayton Motor Car Co., of Dayton, Ohio, has done in working out its Stoddard-Dayton "compartment roadster," a two-passenger car with six-cylinder Knight motor, which just has been added to the line. It is rated at 70 horsepower, has left-hand drive and center control, but the body feature of the car which gives it its designation, is that the baggage is thoroughly protected, no matter what the weather may be, and that it can be reached only by pulling forward a sort of trap door section of the back of the seat. It is not necessary to get out of the car to get things out of the "hold," and the familiar process of moving a lot of spare tires so as to get at a suit-case is made unnecessary. All this does not mean that the passengers are slighted in the matter of accommodations. The body is unusually wide and roomy and the equipment includes top, windshield, seat covers, electric lights and all the usual appurtenances that go with a high-grade machine.

Hot Water to Flush Spokane Streets.

A motor sweeper of unusual construction has been installed by the street cleaning department of Spokane, Wash., and is said to have given a good account of its capabilities. The machine is built according to a patent by H. Briggs, and consists of a combination sprinkler and sweeper. It embodies a tank of water which is heated by passing through the radiator before falling upon the street. The hot water is said to be very effective in loosening dirt and grease, all of which is picked up by the revolving brush placed directly behind the flusher. The sweepings are conveyed into a container which is emptied at each street corner, whence they are collected at intervals by a big "dumping" car of the usual pattern.

ENGINEER ATTACKS ENGINE RATINGS

But Says Existing Formulae May Be Turned to Advantage—Questions Two-Point Ignition and Large Valves.

Almost from its inception, the internal-combustion motor has proven much of a mystery to those who have attempted to evolve formulae for the determination of its power. That a great number of such formulae has been evolved is as well known as is the fact that none is applicable to all engines, and that under different formulae the same engine will show surprising differences of theoretical power according to the method used in attempting to arrive at a figure that will correspond with the actual power given by the engine under a brake test. Dissatisfaction has been, and still is, felt in America, of course, but in England and continental Europe it is felt more keenly because of the excessively high license fees that are imposed on motor cars, and there almost continually new formulae are proposed as solutions of the difficulty.

Recently, however, L. P. Pomeroy, who is a prominent British engineer, has attacked the problem from the other side, and proposes that designers take advantage of the existing formulae to produce motors capable of developing power far in excess of that which their respective ratings would seem to indicate is possible. He expressed his views in a paper which was read before the last meeting of the Institution of Automobile Engineers in England and his purpose in brief was to impart such information to his hearers as would enable them to "cheat" the rating, or, to put it in his own words "to indicate some of the anomalies in the various horsepower rating rules and the means whereby their weaknesses may be of assistance to those engaged in the design of engines."

"Since there seems to be no prospect of a formula being adopted which bears any substantial relation to the actual factors which affect the horsepower obtainable from engines of varying size," he said, "the next best thing is to design our engines to give a maximum horsepower for a minimum rating. This is, of course, a regrettable necessity, especially as it will be seen that a reasonably correct formula has been awaiting wide-spread recognition for a long time."

In leading up to the real subject of his paper, however, Pomeroy found it necessary to analyze the functions of the gasoline engine from A to Z, and though many of his conclusions are interesting, in the main they are but repetitions of the observations of others before him. Excusing himself for the lengthy resume, he said it is necessary because "the most useful weapon in rule cheating is a clear knowl-

edge of the influence of the factors the rule is designed to control."

"A mean effective pressure of 95 pounds per square inch at a revolution speed of 2,500 revolutions per minute is absolutely necessary," he said, "if success in competition be desired, irrespective of the size of the engine. . . . The first considerations of the mean effective pressure will be confined to that range of speed in which it may be, and in practice frequently is, equal in both cases. The compression ratio, the shape of the combustion chamber, the absolute size of same and the valve setting are the chief factors alleged by many who have studied this subject very deeply to influence the mean effective pressure attainable with a gaseous mixture of petrol vapor and air. In the opinion of the writer these are all secondary conditions.

"I have had two engines under observation during the past few months which only differed in respect to their valve arrangement, one having overhead valves, the other being of the orthodox type. The compression ratios were identical, and every precaution was taken to eliminate disturbing factors. The mean effective pressure in each case over a speed range from 600 r. p. m. to 1,000 r. p. m., was substantially the same, i. e., about 96 pounds per square inch. The influence of marked changes in valve setting was also negligible. To develop high mean effective pressures, then, it is essential that a rich mixture be used at a reasonably high compression ratio, not less than 4.8, or 5 to 1, and fired by a first-class magneto. No other ignition device is worth consideration, so far as the author's experience goes.

"It is characteristic of the paucity of information upon the subject of high-speed engines that there seem to be no published data whatever upon the rate of ignition of a compressed explosive mixture under working conditions. Such information as is available refers to static conditions, and would be misleading if the figures were not obviously absurd when applied to practice. For some time I thought that a limit of available engine speed was reached through the apparent impossibility of firing a charge to produce high mean effective pressures beyond a speed of about 2,400 revolutions per minute. Recent experiments have, however, shown that a speed of 3,000 revolutions per minute can be attained before reaching the peak of the horsepower curve. Incidentally, it may be stated that the application of 'series' or two-point ignition to secure this result was absolutely abortive. No difference in horsepower was appreciable at any speed through the simultaneous firing of the charge at opposite sides of the cylinder. The virtues of this system seem to be on a level with many other widely advertised devices in that each gives wonderful results on antiquated types of engines which have before been fitted with an efficient ignition gear, carburetter, or other essential. When applied, however,

to engines already so supplied, the results are generally disappointing. . . .

"High-speed engine design is rapidly resolving itself into a competition between designers who are each trying to graft the largest valve possible onto the smallest cylinder. In its way this is a perfectly healthy tendency, but it has its limits. As the diameter of the valves approaches that of the piston, the compression space becomes unreasonably large, and with a correspondingly low compression the engine is limited in speed owing to sluggishness of firing, which defeats the object in view. Taking for example a $3\frac{1}{8}$ inch bore engine with $2\frac{1}{4}$ inch diameter valve, I have not been able to make the combustion chamber with a volume less than 9 cubic inches, even with the most compact design. As the compression ratio should not be less than 5 to 1, this means that the minimum cylinder capacity should be 36 cubic inches—that is a stroke of 4.7 inches. This may be taken as a minimum limit. The size of valve, $2\frac{1}{4}$ inch diameter, should allow an engine speed of about 5,000 revolutions per minute, and a maximum horsepower of about 75, if nothing intervenes to prevent this speed being realized.

"As to the practicability of such speeds the author offers no opinion, but there is no doubt that before the end of the next twelve months the engine which cannot develop its maximum horsepower and keep going at 3,000 revolutions per minute will be a back number. It may be asked if any good can come from this tendency to ultra high speed. The answer is that the firm which is building this class of machine is adding to its knowledge of the durability of materials and of the effect of detail alterations to engines, at a rate which is incredible to those without similar experience. The data thus obtained are rapidly reflected in the standard product, especially as in the majority of cases the high speed engine is practically identical with the standard product save in some few important details. If simplicity and fewness of parts be desirable in a touring car engine, they are absolute essentials on high speed engines, where all parts are necessarily highly stressed.

Before turning formally to the subject of "cheating" the ratings, he drew the following four conclusions:

- (a) That high mean effective pressures depend upon mixture strength;
- (b) That high mean effective pressures at high speeds depend upon high volumetric efficiency and high compression;
- (c) That high volumetric efficiency depends entirely upon large ports and valves;
- (d) That lightness of moving parts is essential if high mechanical efficiency is desired.

"If these conclusions be true," he continued "then it follows that, given sufficient valve and port area, horsepower is directly proportional to the cylinder capacity and to the revolutions per minute. It then only

becomes necessary to design for either a minimum rating for a given cylinder capacity, or a maximum cylinder capacity for a given rating. It will be shown that the advantages to be thus obtained are well worth a little study.

"Whilst the formulae in present use are so obviously anomalous there can be only two consequences; either designers must take advantage of the weakness of the formulae used, or competitions will die a natural death, except for restricted classes of cars. From what has been said there should be little difficulty in keeping competitions alive. It is of interest, therefore, to investigate the means for so doing.

"The Royal Automobile Club formula obviously encourages the small bore, long stroke engine. A few rough preliminary designs will soon indicate the point at which small bore and long stroke become cumbersome and awkward. The Remington formula may be similarly treated, as will be seen from the following: An engine $3\frac{1}{8}$ inch by 6 inch, has the same cylinder capacity as one 3.5 inches by 4.75 inches. The available horsepower is the same in each. The relation between the rated horsepowers in each case is 0.86 to 1. The small bore long stroke therefore scores to the extent of 14 per cent. The same example according to the Lanchester formula gives a relative horsepower rating of 0.95 to 1, an advantage to the small bore engine of 5 per cent. For engines of the same bore and different stroke it fails as has been indicated.

"The S. M. M. T. and Rating Committee formulae are of the same form, and can be treated together. These formulae involve the term r , the ratio of stroke to bore. For engines of the same cylinder capacity such as those previously mentioned, the ratings are as follows:

S. M. M. T. 0.9 to 1, an advantage to the small bore of 10 per cent.

Rating Committee .098 to 1, an advantage to the small bore of 2 per cent.

"This last result is in close agreement with what is to be expected, and is apt to inspire an ill-founded sense of security. If, however, the formulae be applied in the case of two larger engines of the same capacity, say, 4 inches by 7.8 inches, and 5 inches by 5 inches respectively, the relative ratings under the Rating Committee's formulae are as 0.89 to 1, an advantage of 11 per cent. to the small bore engine. This is, of course, due to the fact that the rating depends upon the absolute dimensions of the cylinder bore, not its relative value, and is an example of the pernicious influence of the cooling correction. By such methods as those indicated above it will be found a simple matter to design for minimum rating.

"The French have had this problem under consideration as well as ourselves, and have gone through much the same experience as we are now going through here. In 1903 M. Varlet proposed the formula:

$\text{horsepower} = kd2n$, which is, of course, that adopted by the Royal Automobile Club in 1905. It was also introduced with almost the same remarks as to its inapplicability to cases where an exact result was required. In 1906 the Automobile Club de France deduced an empirical formula from a series of tests in which the maximum horsepower was determined, not, be it understood at any given piston speed or with any special limitations, but from 96 engines varying in size from 65mm bore and 75mm stroke to 190mm bore and 200mm stroke.

"It is essential that before any formula can be accepted as rational, the ideas underlying it and the theories it expresses must square with the generally accepted facts, and with our commonsense as engineers. If there is any source from which a formula, which is neither fantastic nor inconsistent, should spring, it is surely this Institution. From a scientific point of view the subject is of great interest, but there is another aspect as well, that is, its effect upon the result of those competitions upon which the trade to so large an extent depends for publicity. Surely it is best in the interests of all concerned that something like unanimity should exist upon the very matter which is the foundation of engine design in general. It is an abiding confession of weakness if we are not able to predict with some accuracy what horsepower a proposed engine will develop.

"Whilst the formula controls rather than allows free scope to the designer, freakishness creeps in which eventually finds its way into the cars made for the public. Those who have spent any time trying to eliminate the unmechanical legacies of our designer forefathers know how difficult the task is. In the author's opinion no formula has yet been offered which comes nearer to the facts than

$$h.p. = kVnN,$$

where V = cylinder volume, N = number of cylinders. If experience shows that the index n continues to be unity, so much the better, it can always be adapted to suit any pronounced failing of the weaker vessel. It is consistent with the average engineer's PLAN/33,000 idea of horsepower whilst allowing a free hand in design. The only real unknown is r ; the revolutions per minute and differences in this respect are not great in high speed engines of the present day. Even if they were, revolutions are of an abstract nature, they cost nothing, weigh nothing, have no shape or substance. If one man can get more revolutions than another, it is hard to find a reason why he should not benefit thereby, especially as, in my experience, the capacity for high speed does not detract from the ability of an engine to run and pull well at slow speeds."

To Render Iron and Steel Unrustable.

To produce an inoxidizable surface on iron and steel, make the article to be so coated the anode in a bath of distilled water

at a temperature of about 160° F., the cathode being a carbon plate. The current should have only sufficient electromotive force to overcome the resistance of the circuit and decompose the water. The oxygen liberated at the anode combines with the iron to form the magnetic oxide of iron (Fe_3O_4) which resists the action of the atmosphere, and protects the iron beneath it. The action should be continued for an hour, at which time the coating is sufficient heavy to use a scratch brush on it, and polish.

Lubrication to Increase Spring Comfort.

The utmost degree of comfort cannot be expected of a car if the springs are not kept in such condition that they can move freely. A cause of stiff spring action that is quite common is the rusting of the leaves, making them move upon each other with great deal of friction, usually accompanied by more or less squeaking. Rusted spring leaves should be forced apart with a screwdriver or similar tool, and oil mixed with graphite run in. Do not use kerosene, as it has a corrosive effect on iron and steel. Oil will not last long between the leaves of a spring, but graphite will stick for a long time.

Soldering Rivets on Tank Bottoms.

It is quite a difficult operation to solder a leaky rivet at the bottom of a fuel tank without removing the tank, especially if the rivet is an iron one. However, it can be accomplished quite easily by means of the following expedient: Take the top off an old polish can, clean well and tin, fill it with solder and hold it in place over the rivet with a good hot iron until the solder melts. Press the point of a file against the cap until the solder hardens, and the rivet will be tight.

Straining Gasolene and Keeping It Clean.

Too much care cannot be taken in straining gasolene and in keeping the strainers clean. If the gasolene line includes a separator, the sediment and water should be drawn off at frequent intervals through the cock at the bottom. In the case of a new car, or when a new tank has been installed, it not infrequently happens that the settling chamber of the separator will become so filled with foreign matter that a wire must be run through the cock before gasolene will flow.

Wrench Handling That Spoils Nuts.

Some people make a great deal of trouble for themselves by using wrenches that are a little too large for the nuts they are required to turn, or by neglecting to place the wrench squarely on the nut. In either case the result is to round off the corners of the nut, not only spoiling its appearance, but making it more difficult to get hold of. A wrench should fit snugly on the nut, and this applies to adjustable as well as to solid wrenches.

STOVE THAT SERVES TWO PURPOSES

"Taxicabber" James Invents One to be Carried on Running Board—Keeps Water and Passengers Warm.

Charles C. James, who recently organized the immense taxicab purchasing pool styled the International Motor Service Association, of New York, of which he is the head, has turned his attention to other things not so intimately connected with the taxicab and rental service business. His latest achievement is the invention of a miniature gasolene stove which he styles the James "Thermos," and which is designed to occupy an unobstructive place on the running board of an automobile, its purpose being to keep the cooling water warm and the inside of the car (if it is a closed one) "at summer heat." A patent has been applied for and eventually the device will be manufactured and marketed by a stock company, though regarding who will be connected with the company other than himself, James is reticent; he says, however, that it probably will be known as the James Appliances Co., the plurality being due to the fact that he expects to add at least one other "appliance," in the near future. At any rate, the new company will have no connection with James's other venture.

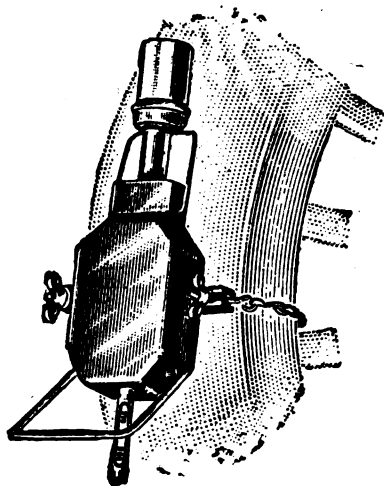
At present, James is confining his efforts to the manufacture of several of the heaters as it is his intention to exhibit them at the forthcoming shows, where they will be placed on sale at \$25 apiece. In its simplest aspect, the "Thermos" is merely a brass cylinder some seven or eight inches in diameter, in which there is a coil of copper tubing, and a gasolene burner. The burner, however, is in reality two burners, one of them being similar to those commonly used in the gasolene torches used by plumbers and the other being merely a pilot flame. Fuel is obtained by tapping directly into the gasolene line on the car. The circulating water is piped into the heater coil from the bottom of the radiator, and back to the water jackets of the engine through the ordinary water intake pipe near the bottom of the cylinders. Though the burner has been tested under severe conditions, and it is claimed that it is impossible to put it out except by means of the cock provided for the purpose, a safety appliance in the form of a thermostat automatically turns off the gasolene in case the flame goes out and keeps the valve open when the burner is lighted. The device is arbitrarily set to maintain the temperature of the cooling water between 100 and 150 degrees Fahrenheit, though the setting may be changed at will to afford a wide temperature range.

To heat the inside of closed cars, or either of the compartments of open cars, a hot

air pipe leads from the top of the stove. Among the claims which are made for the device is that it will obviate the necessity for self-starting devices because it always is easier to start a warm motor on the spark than it is a cold one. Though the device is intended primarily for use outdoors to prevent the water in the jackets and radiator freezing when the car is left standing with the motor idle, James says it may also be left burning without danger of fire, when a car is stored over night in an unheated garage.

Steam Vulcanizer With Suggestive Title.

To the increasing number of portable tire vulcanizers there has been added the E-Z-2-Work steam vulcanizer, the title of which is self-suggestive. With the apparatus it is possible to repair cuts without removing the shoe from the wheel, or de-



flating the tube, and without risk of burning.

The apparatus consists of a heavy cast brass box, on either side of which are two slotted lugs. Two eye bolts, connected with a heavy chain of sufficient length to pass around the wheel rim and provided with wing nuts, slide into the slots in the lugs, providing the means of attaching the vulcanizer in the proper position on the tire. The face plate of the box is made concave in form to fit snugly over the tire surface. Repairing is accomplished by first filling the cut with soft rubber, then firmly attaching the machine so that the face plate covers the break. The alcohol lamp is then lighted, and the box being partly filled with water, steam soon forms, heating all parts of the apparatus to the same temperature, which is indicated on the thermometer projecting through the top. When the required temperature is reached, the lamp is regulated to maintain it. The vulcanizer then can be left to complete its work without fear of the tire being burned, since the temperature cannot exceed the predetermined limit.

The outfit, which is made entirely of brass, is produced by the E-Z-2-Work Steam Vulcanizer Co., of Cleveland, Ohio.

MAKING THE MOST OF WORM GEARS.

Lubrication and Ample Bearing Surfaces Better Than Large Thread Angles—What Three Tests Disclosed.

Despite the widespread use of the worm drive abroad, there always has been, and in many instances there still remains, considerable misconception regarding its theory. Similarly, accurate data regarding the actual efficiency of worm drives, as constructed for automobile use, are not plentiful. With a view to obtaining such data for the purpose of comparing the relative efficiencies of several worm drives, a noted Swiss manufacturer, who, it is claimed, is the originator of high efficiency commercial worm drives, has made several tests which are interesting, inasmuch as they show that with careful designing and construction and proper attention to lubrication, as low a coefficient of friction as 0.01 can be obtained.

For the purpose of the tests, explains a British engineer in the Autocar, the three gears observed were constructed as nearly alike as is mechanically possible with progressively different thread angles for the specific purpose of bringing out the influence of thread angle on efficiency and capacity. The results of the tests were as follows:

- (A) Two-thread worm, 10 degree angle.
Worm 1 inch pitch, 2 inches lead, 3.55 inches pitch diameter.
Wheel 43 teeth, 13.7 inches pitch diameter.
Maximum efficiency, 82 per cent. at 5.5 horsepower.
- (B) Three-thread worm, 20 degree angle.
Worm 1 inch pitch, 3 inches lead, 3.55 inches pitch diameter.
Wheel 43 teeth, 13.7 inches pitch diameter.
Maximum efficiency, 86 per cent. at 10 horsepower.
- (C) Four-thread worm, 20 degree angle.
Worm 1 inch pitch, 4 inches lead, 3.52 inches pitch diameter.
Wheel 44 teeth, 14 inches pitch diameter.
Maximum efficiency, 94 per cent. at 15 horsepower.

"At 32 degrees thread angle," he says in discussing the tests, "and with the same coefficient of friction of 0.01, a worm gear alone (excluding journal and thrust bearing losses) has been shown to have an efficiency of 97.5 per cent. Now the thrust on the wheel increases quite materially with the thread angle, so, it is submitted, angles above 35 degrees are not worth while.

"The objection to 45 degree thread angle is mainly on account of its extravagant constructional cost; not in cutting the particular angle, but because the angle puts

up so largely the diameter of the worm wheel.

This can be shown by taking a concrete case. Take a 5 to 1 ratio (corresponding to 30 miles per hour on 35-inch wheels with an engine speed of 1,500 revolutions per minute), and assume that a $\frac{3}{4}$ inch pitch tooth is considered necessary. For 30 degree angle (actually 31 degrees) the gear might be, say:

Worm 6 threads, $4\frac{1}{2}$ inch lead, $2\frac{3}{8}$ inch pitch diameter.

Wheel 30 teeth, 7.15 inch pitch diameter
For 45 degree angle the gear might be:

Worm 10 threads, $7\frac{1}{2}$ inch lead, $2\frac{3}{8}$ inch pitch diameter.

Wheel 50 teeth, 11.9 inch pitch diameter.

That is, the wheel and casing are some 65 per cent. larger for a 45 degree angle than for a 31 degree. This comparison is not a rigorously accurate one, because, as may be gathered from the actual cases previously quoted, the output is increased very materially with increasing lead and angle, so that one would choose a smaller pitch diameter and a small pitch with the ten tooth than with the six tooth worm. But the conclusion remains good, and the contention is that at about 30 degree to 35 degree thread angle it pays better to concentrate on lubrication and a low coefficient of friction than on increased angle.

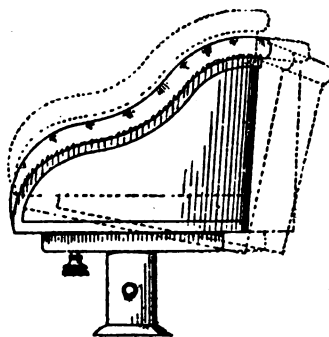
"A low coefficient of friction involves three things mainly—good and adequate surfaces and good oil. Good oil alone will not do it, nor will good surfaces alone; the two combined will not do it without the adequacy, for the lasting essential is entire absence of metal-to-metal contact. The oil film must be maintained unbroken, it is the oil that must wear, not the metals. If surfaces be inadequate the intensity of pressure rises beyond that at which oil can remain between them; it is squeezed out and metal-to-metal contact ensues, with immediate loss of efficiency and rapid destruction. It is right here, on this question of adequacy, that the text books omit to give the designer any help, and where a designer, with a true knowledge of the underlying principles, has failed it is perfectly certain that he has erred on inadequacy of surfaces.

"Broadly, it may be stated that the pressure sustaining area of a worm gear—the capacity of transmitting effective thrust—is, other things being equal, proportional to the diameter of the worm and to the square root of the diameter of the wheel. The things that are not equal, and which modify these simple relations, are speed of rubbing contact, material and physical character of the surfaces, lubricant and permissible temperature rise—every one of which must be suitably allowed for in the design. For successful design without extravagance one must have had experience and lots of it. After that with the best of design a failure will result from either bad material, bad workmanship, bad lubricant, or bad

support. In the design of the differential outer case it is a good plan to incorporate radiating fins as is now done on crank chamber bases, and as to the internal arrangement, this should be as open as practicable, so as to contain the greatest possible quantity of oil and to permit of its free circulation."

Driver's Seat Made Adjustable.

Though automobile seats which may be adjusted longitudinally, for the accommodation of drivers of varying leg lengths, are not a novelty, it remained for a British designer to evolve a type of seat which may be adjusted vertically as well and in addition may be tilted almost to any angle. Brainsby & Sons, London, have introduced the new seat, which may be raised or lowered three inches and moved backward or forward five inches. As may be seen by the accompanying illustration, the method



SWIVELING SEAT FOR DRIVERS.

of fastening the seat is quite simple, the arrangement being not unlike the familiar swiveling office chair; like one, it may be turned and tilted in a great variety of ways and locked in any position by the mere turning of a small hand wheel. Furthermore, the seat may be adjusted without the necessity of the occupant getting out of it. Though the seat is intended primarily for the driver, and in this connection it is pointed out that its use obviates the necessity for providing adjustable steering columns and pedals, which elements of control therefore may be still further standardized, it may be used for other passengers as well.

Regarding the failure of worm drives, he says that on proper investigation the cause always may be quite readily diagnosed. "On one constantly running set of 150 horsepower," he cites as an instance, "though the design was good, the material in the wheel was bad. Frequently the thread angle has been found too low; sometimes with a good enough angle the worm diameter has been too great, resulting in excessive rubbing speeds. Not rarely the surfaces have been totally inadequate, while occasionally the machining has been at fault—center distance wrong or alignment defective."

"Any maker with a reasonably silent engine and gear box," he asseverates, "who, after trial, has abandoned worm gear on the live axle has made a mistake. He has either not understood the problem, or he has been betrayed by his works—or he isn't British. He may positively like noise!"

In conclusion, he quotes himself in reference to the hollowed type worm, the statement originally appearing in a paper read in 1907 before the Institution of Engineers and Shipbuilders in Scotland. "The so-called Hindley worm gear, practically unknown in this country," he repeats, "is largely used in the United States. The substitution of a hollowed worm for a parallel one, without any other alteration, is definitely stated in certain cases to have converted failures into successes. If the contention that the hollow worm affords increased pressure—sustaining contact area can be maintained, and appearances are certainly in its favor—then the departure is justified, for the higher cost of the worm will be more than balanced by the higher rating of the whole gear."

"To this day the Hindley worm has never caught on in Great Britain. That it is justified is sufficiently proved by its continued use on the Lanchester car. The ordinary parallel worm can be milled as a repetition process, and it can be turned in a good lathe, whereas the Hindley worm cannot be milled with any usual equipment, and it requires quite a special equipment for turning; moreover, it demands exceeding accuracy in setting, and it must not be allowed even the very least end play. It is not known that any trustworthy test results have been published showing either the efficiency of the worm or its capacity."

Automobile Blamed for Decline of Art.

It has been some time since an industrious investigator or statistician has forced himself into the limelight with some new crime which the motor car has committed—or is supposed to be responsible for. To the voluminous list of "horrors" which have been ascribed to the motor car, and which include such things as naso-motorrhinitis, decline of the silk-hat industry, leather scarcity, decrease of card and billiard playing, etc., there now must be added the regrettable loss of an appreciation of "high art"—which loss was lamented in a recent public address by David Murray, a Member of the British Royal Academy, before the Royal College of Art, at London, England. In the course of his talk Mr. Murray stated that the active interest of fine art has abated. "We are suffering from the 'motor mind,'" he declared; "those who can afford to secure and appreciate art of all kinds have learned to rush through space at such a speed that the habit of being content with the swift superficial glance has been acquired, and the delight in close inspection which alone reveals the beauty of craftsmanship and art, is almost entirely resigned."

HAS OUTSIDE SLEEVE THAT SLIDES

Coates-Cameron Design That Facilitates Lubrication and Cooling—Sleeve Not in Contact With the Piston.

Though the subject more than once has been broached, and sporadic attempts have been made to produce a sleeve valve engine with the sleeves outside the cylinders instead of between them and the pistons, as they are in the Knight engine and the later Argyll engine, which is of Scottish origin, it remained for another British inventor to perfect an engine of such design. It is styled the Coates-Cameron, and though it closely resembles its prototype, the Argyll, in most of its essential features, it is distinctly different in the application of the

and the outer casings which serve to enclose the sleeves are cast in pairs. The working cylinder, A, is cast integral with its head, C, and is water-jacketed for the greater part of its length. Between the outer casing and the water jackets of the working cylinders is located the single sleeve, B, which is practically identical with the Argyll sleeve as regards the shape of its ports and its reciprocal and partially rotary motion. The peculiar shape of the sleeve ports, L, is shown quite clearly in the illustration, the cylinder ports being similar in shape and shown by dotted lines. In each cylinder there are four inlet and four exhaust ports arranged circumferentially in the same plane. The sleeve ports are seven in number, three for inlet and three for exhaust, the odd port being slightly different in shape and serving alternately for both. All the inlet cylinder ports register simultaneously with the inlet ports in the

pin, H, which is coupled to the sleeve by a knuckle joint and bracket extension of the sleeve. The rotation of the skew gear, G, therefore imparts to each sleeve a reciprocal motion in addition to a partially rotative movement, the effect being that, as is the case in the Argyll engine, any point on the sleeve describes an ellipse during two revolutions of the crankshaft.

During the compression and firing strokes, each cylinder is sealed by the position of the sleeve ports behind a wide ring, M, which serves the same purpose of the "junk" ring in the Knight engine in this respect. The possibility of gas leakage is further obviated by the presence of packing rings on the sleeves above and below the "junk" ring.

To Test the Exhaust Valve Springs.

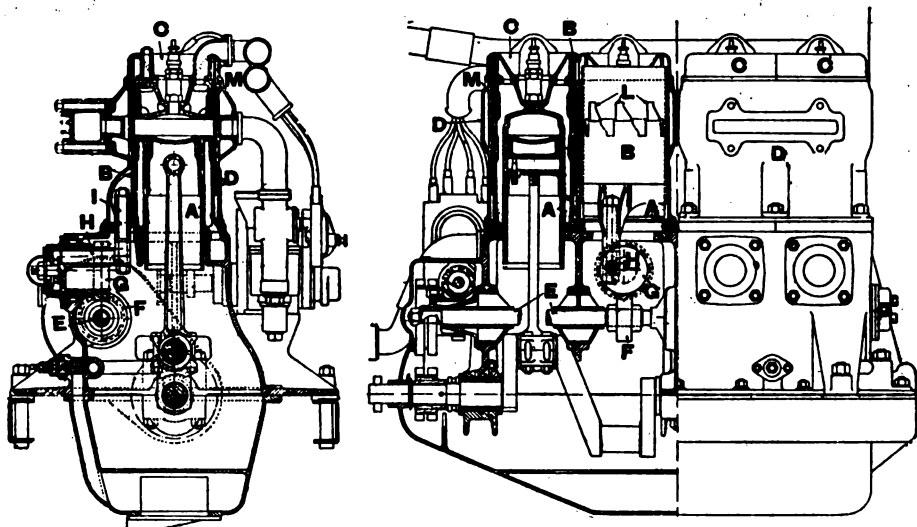
To a very considerable extent the smooth running and efficiency of a gasoline motor depends upon the valve springs being of the correct strength and upon their uniformity. Springs will deteriorate with use, especially the exhaust valve springs, which are exposed to heat, and when they become weak they should be discarded. In order to test valve springs for weakness without removing them from their places, make a lever with a forked end to fit under the spring, a fixed fulcrum arranged to be placed on any convenient support and an ordinary spring balance at the outer end, the longest arm of the lever. Hook enough weight on the spring balance to pull the lever down a given distance; the weight and the distance should be the same for all the springs. A standard can be set by trying the apparatus on a spring known to be correct.

Keeping Water Out of the Gasolene.

The cap which covers the filling opening of the gasoline tank usually is drilled with a small hole commonly called a "vent," but which really is there for the purpose of admitting air to fill the space left by the fuel as it is used, and so prevent the formation of a partial vacuum and the stoppage of the feed to the carburetter. If the cap is in an exposed position and the hole is drilled in the top, rain water can enter and may get into the tank. This can be avoided, however, by plugging up the hole in the top and drilling another in the side of the cap, under a projecting bead or the like, if possible.

Smaller Plug Gaps for Weak Batteries.

The motorist who finds himself far from home with no magneto and his batteries on the verge of dissolution, can sometimes delay the end somewhat by decreasing the width of the gaps between the points of the spark plugs, so that the comparatively feeble current can make the passage and produce a spark hot enough to ignite a good mixture. Correct adjustment of the carburetter and the vibrators will help out in such a case.



COATES-CAMERON SLEEVE VALVE ENGINE IN DETAIL

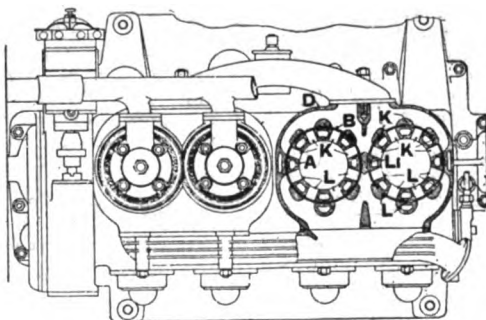
theory and in the style of cylinder construction.

Its principal point of difference is that the sleeves are outside the cylinder walls proper, which construction, it is claimed, eliminates many of the undesirable features in other types of sleeve valve engines. Not the least of the advantages claimed for the new engine is that the wear on valve parts is considerably reduced for the reason that the sleeves operate between stationary instead of moving surfaces. That the location of the sleeves eliminates the side thrust of the pistons and that the pistons themselves are not subjected to twisting stresses due to the partial rotative motion of the sleeves is obvious. Furthermore, it is claimed that the location of the sleeves outside the cylinders permits of more efficient cooling of the valve parts and that lubrication also is facilitated.

As may be seen in the accompanying illustrations, the engine is not unlike the orthodox four-cylinder motor in appearance. In construction, however, it is unusual, inasmuch as the cylinders are cast separately

sleeve on the induction stroke, and on the exhaust stroke all the exhaust ports register at once.

The sleeves are actuated in exactly the same way as are those in the Argyll en-



THE VALVE PORTS

gine, the valveshaft, E, being driven from the crankshaft by a silent chain. On the valveshaft there are four skew gears, F, one for each sleeve, and these engage the skew gear wheels, G. Each sleeve is attached to its gearing by means of an eccentric

1912

New Years Eve

Ring out, wild bells, to the wild sky,
The flying cloud, the frosty night;
The year is dying in the night;
Ring out, wild bells, and let him die.

Ring out the old, ring in the new;
Ring happy bells, across the snow;
The year is going, let him go;
Ring out the false, ring in the true.

—Tennyson.

A Card In re Vanderbilt Race and F & S Ball Bearings

A man hath joy by the answer of his mouth: and a word
spoken in due season, how good is it!—*Proverbs xv: 23.*

For over fifteen years the world-renowned house of Fichtel & Sachs, of Schweinfurt, a/M, Germany, the makers of the famous F. & S. Ball Bearings, by virtue of their fundamental patents in all countries, their own inventions, and those acquired from other original sources, have occupied the premier position in the ball bearing industry. This supremacy has been unquestioned because of not only the high quality, but also because of their quantity production of fifteen thousand complete ball bearings daily for various purposes, besides which, their allied ball making plant produces millions of chrome steel balls daily, the two plants employing over thirty-five hundred work-people.

Meanwhile the J. S. Bretz Company, their sole American Representatives, have not been unmindful of the high standing and dignity of the great German concern, and in all their ball bearing literature, advertising, publicity and selling campaigns have adhered strictly to ideal, high-minded, safe and sane methods of doing business. That this course was founded on correct principles is evidenced by the constant growth and volume of our business, the mechanical popularity of the bearing, and our financial success and prosperity from a humble beginning.

A self-appointed public censor of our advertising, has in his own heterophemistic way raised a tempest in a teapot over the ball bearings used in the four placed cars in the Vanderbilt Race.

It was Webster who said: "Never mind, your honor, what the plaintiff claims, what say this array of competent witnesses?" Webster's logic applies admirably well to this controversy, doesn't it?

One of the earliest and largest American users of F. & S. Ball Bearings was and is the Lozier Motor Car Company. Almost every notable competitive event won by them, such as road races, hill climbs, gasoline efficiency trials, speedway races, twenty-four hour races, etc., etc., was done on cars equipped with F. & S. Ball Bearings. Naturally enough we rejoiced with them, their agents, and the Lozier car users over these victories. We advertised these many wins, sometimes by means of signed testimonials from the Lozier Motor Car Company, the latter of

which attributed the success of the Lozier cars in these events to the F. & S. Ball Bearings. It is to be noted that we always do all of this with the different makes of cars who use the F. & S. product, not so much for our own personal profit, but to advertise the users of F. & S. Bearings in particular, and to spread the gospel of anti-friction construction in the conservation of power, by that "efficiency which is the ratio between a standard of performance and the actual performance."

If we were fond of Kipling we might quote—"After me cometh a Builder—Tell him I, too, have known!" Here follows the whole bearing story of the Vanderbilt Race:

Copy of telegram to
LOZIER MOTOR COMPANY,
Detroit, Michigan.

Dec. 16, 1911.

— raises controversy over our advertisement that F. & S. bearings were used in Lozier Vanderbilt cars—our authority your Mr. Perrin. Kindly wire confirmation stating where our bearings were used, and if other makes, also state what and where. Reply desired by Monday. Yours for fair play.
J. S. BRETZ COMPANY.

Lozier says—"The makers of the F. & S. Bearings are, therefore, correct in stating their bearings were used in this car."

LOZIER MOTOR COMPANY
DETROIT, MICH.

Manufacturing Dept.,
J. S. BRETZ COMPANY,
New York, N. Y.

December 16, 1911.

BEARINGS USED IN RACER.

Gentlemen—In answer to your telegram relative to the bearings used in car which won the Vanderbilt Cup Race, would

A Card

In re Vanderbilt Race

and

F & S Ball Bearings

(Continued)

state that this car was fitted with — — — bearings throughout the entire engine, and also throughout the transmission, with the exception that one small F. & S. bearing was used in transmission on account of its narrow width, and a couple of thrust bearings of the F. & S. make were also used.

The rear axle, however, was fitted with the F. & S. Bearings. This is in accordance with statement I have made both to the — — — and F. & S. people. The makers of the F. & S. Bearings are, therefore, correct in stating that their bearings were used in this car as long as they do not state they were used exclusively. This car happened to have been assembled before we began receiving axles made at our Plattsburgh plant, which axles are fitted with — — — bearings.

Yours truly,

JGP D (Signed) J. G. PERRIN,
Copy to — — — Mfg. Co. Ch. Engineer.

De Palma's Mercedes Had F. & S. Bearings

The famous Mercedes cars, which set the fashion to the world in more ways than one, largely use F. & S. Bearings. Manager J. A. Carples, of the Daimler Import Company, says their Chief Engineer told him recently in Germany that F. & S. Bearings were a standard stock equipment on Mercedes cars—both racing and touring.

Ralph De Palma, the metropolitan favorite who drove the Mercedes which finished second, when asked the question which bearings his car had in it, said, "I drove this great car just as I received it from Germany, and if it had any other bearings in it than F. & S., they were placed in it in Germany, and I invite you to inspect it yourselves. The seals on the hub caps are still unbroken, and I have this to say regarding a change of construction in any car I drive: I consider the master mind who designed these racing cars knows what is best to use, and in view of my public announcement of this idea, no one has ever approached me with a view of making a change."

An examination of the De Palma Mercedes car revealed the fact that this car was equipped with F. & S. bearings, and absolutely so in the wheels, which bearings were in dispute.

Regarding the Mercedes which finished third in the race, which was driven by that dashing young American driver, Spencer Wishart, we have this to say: Although the majority of the bearings used in the car are now of another make, still some F. & S. bearings were used, but not enough to emphasize their use—all of which leads up to the variation in the practice of compound use of ball bearings in cars, and hence the use of ball bearings is sometimes as Herbert Spencer once said, "A combination of heterogeneous changes, simultaneous and successive, in correspondence with external coexistences and sequences."

The F. & S. bearing De Palma Mercedes finished second in both the Vanderbilt and Grand Prix races, and is ready without

repairs for another race to-day, while the Wishart Mercedes did not finish in the Grand Prix, and lies dismantled to-day.

And so in summing up the result of the Mercedes ball bearing claims, one is reminded of the following squib: "Faith," said the policeman, examining the broken window, "this is more say-rious thin Oi thought it was! It's broke on both sides!"

A Disclaimer

The following letter from Mr. A. L. Riker, Vice-President and Chief Engineer of the Locomobile Company of America, in reply to a letter of ours asking for information as to what bearings were used in Robertson's Locomobile in the 1908 Vanderbilt Race, prompts us to cheerfully enter a disclaimer here as to the use of our bearings in that car. The statement, however, having been originally made in the hurry of preparing copy for an ad, the writer having in mind at the time the fact that the Locomobile Company, since that time, have been continuous users of F. & S. Bearings.

THE LOCOMOBILE COMPANY OF AMERICA ENGINEERING DEPARTMENT

Bridgeport, Conn., Dec. 21, 1911.
J. S. BRETZ COMPANY,
New York City.

Gentlemen—I have your favor of the 20th instant and note contents of same. I would state that the make and type of the anti-friction bearing used in Robertson's winning Locomobile in the 1908 Vanderbilt Cup Race, were the — — — annular ball bearings. These ball bearings we used in the wheels, jack shaft bearings and transmission. They also were the American made ball bearings, as they were the same as we used in the Vanderbilt Cup Race of 1906.

Yours very truly,
(Signed) A. L. RIKER,
Vice-President.

This closes this discussion in the trade press as to the results of the bearings used in the Vanderbilt Race as far as we are concerned, our time and thoughts being turned towards the coming New Year, the Shows and other events, and in conclusion, we wish that "Content be ever yours—good health, prosperity, and thought for us who ever seek to serve."

J. S. BRETZ COMPANY
SOLE IMPORTERS
F & S Ball Bearings
250 West Fifty-fourth, New York

COULDN'T FIND A PLACE TO REST

Jerseyman's Car "Spirited" from Garage to Garage and the Owner Led a Merry Chase—Amusing Results of a Loan.

A mix-up in automobiles and garages, which probably is without an equal in the trade, for two days last week occupied the undivided attention of the Union (N. J.) police department to the great joy of the house-breaking fraternity and hold-up men. From the conflicting and somewhat hysterical accounts of the matter the following facts may be gleaned: William Rueckert, of Ridgefield Park, owned a Maxwell touring car, and placed it in storage in Moran's garage in Jersey City. Owing to a passing financial stringency he was unable to pay the storage charges and temporarily transferred the car to George Koch, of Union Hill, provided the latter would take it out and pay the charges. Koch, according to his own version of the matter, was to have free use of it until spring, but the agreement didn't say so.

Koch gleefully went to the garage, got out the car on a written order from Rueckert, and placed it into Knust's garage in North Hudson. In the meantime Rueckert got some money and wanted the car back, but couldn't find it. Finally he located it in North Hudson, and, finding only a boy in charge of the garage, represented himself as the owner and drove away with the car to another garage, where he placed it under a different name. Koch, in some way, traced the car, found out all about the fictitious name and sent a man to fetch the car. This man represented himself as the "fictitious" owner's chauffeur and spirited the machine away to still another garage. At this point the police was asked to take a hand in the game of "hide and seek." Koch complained about Rueckert and Rueckert said that Koch ought to be glad he got four days' use out of the car for the \$72 he paid to the storage man. Koch couldn't see it that way and asked protection from Rueckert's machinations. After hearing the argument for both sides the captain of Union's police force wisely decided to dodge the issue and referred the men to a magistrate—instructing the men of his force to steer clear of either and both of the combatants.

Maine Elects Five Vice-Presidents.

At the annual meeting of the Maine Automobile Association the following officers were elected for the ensuing year: President, Dr. S. C. Gordon, of Portland; First Vice-President, L. A. Burleigh, of Augusta; Second Vice-President, Philip J. Deering, of Portland; third vice-president, H. A. Chapman, of Bangor; Fourth Vice-President, Charles H. Foggs, of Houlton; Fifth Vice-President—George T. Files, of

Brunswick; secretary and treasurer, John C. Scates, of Westbrook. Directors, E. A. Doten, of Portland, chairman; Dr. John F. Thompson, William N. Taylor, Silas B. Adams, Walter B. Parker, of Portland, F. L. Allen of Fairfield, A. Q. Miller of Auburn, George M. Atwood of Paris Hill and Hartley C. Baxter of Brunswick.

Loosens Bolts and Motor Crushes Him.

While it frequently has happened that a whole automobile has fallen upon and crushed a man, it is a rare thing indeed that the motor becomes loosened from its fastenings and falls upon the man trying to repair it. This unusual accident, however, occurred early last week in Irvington-on-Hudson, when Henry F. Lord, treasurer of the Lord & Burnham Co., was crushed beneath the engine of his car in his own garage. From the position of his body it was apparent that he had crawled under the car to make a repair, and that during this process he unloosened a sufficient number of bolts to cause the heavy engine to drop down upon his breast. He had died several hours before search for him disclosed the accident.

Asks \$10,000 for Racing Driver's Death.

Whether or not James L. Russell, Chicago sales agent for Pope-Hartford cars, was responsible for the poor condition of the inner tubes on David Buck's racing car, which upset in the race for the Elgin trophy on August 26, 1911, causing the driver's and mechanic's death, will be decided by the Chicago courts. The evidence for and against is to be examined as a result of a suit for \$10,000, which has been entered by David Buck's widow against Russell, charging him with negligence in having the car in a safe condition, particularly in regard to the inner tubes.

Speedway Site Not Yet Acquired.

Despite reports which have been published broadcast the Metropolitan Motor Speedway Association has not yet acquired or taken title to the site for the two-mile circular speedway which it proposes to construct on the so-called "meadows" or marsh land adjacent to Jersey City. The association has an option on the more or less liquid real estate, and has made some progress toward overcoming obstacles which have presented, but it probably will be some time before any definite purchase or other transaction is effected.

Philadelphia Club to Build New Home.

Fired with a desire to emulate the Automobile Club of America and the Royal Automobile Club of Great Britain in so far as magnificence of their clubhouses is concerned, the Philadelphia Automobile Club is preparing to erect a splendid edifice on the southeast corner of Ludlow and Twenty-third streets. The structure will be fitted out in the most sumptuous manner and will cost \$250,000.

FRANCE FEARS INVASION BY MOTOR

Kaiser's Soldiers Become Chauffeurs and Study French Roads—Efficiency of 3,000 Automobiles as Military Transports.

The excitable Frenchman, who periodically goes into hysterics over alleged spying carried on by German emissaries, has found another cause for worry in the recent establishment of German military automobile stations along the French frontier. As one of the French chauvinistic papers puts it: "With the greatest ease Germany can throw into France, within one hour after the order for mobilization has gone forth, no less than 300 guns mounted on automobiles, accompanied by a force of 28,000 soldiers."

How this astonishing mobility of the German military forces is accomplished is explained in detail, in the course of an article appearing in *L'Auto*, Paris. French "investigators"—they don't call them spies in France, as long as they work in France's behalf—managed to collect a great deal of information in connection with the reorganization of the German military automobile park, and found to their surprise and alarm that the Kaiser had at his disposal no less than 800 automobiles at Malmedy, 850 at Metz, 350 at Chateau-Salins, 280 at Dieuze, 500 at Saarburg and about 500 more in smaller places close to the French frontier in Alsace-Lorraine. About nine-tenths of these cars are in private possession but can be instantly acquired by the government in case of war. The remaining tenth include automobile gun carriages, "road trains" and subsidized trucks. As none of the cities mentioned in the list is further away from the frontier than one hour's drive, it can be seen how much reason there may be in the Frenchmen's excitement; for in three hours all of 3,300 cars can have returned with a second load of 25,000 to 30,000 men.

What caused the greatest alarm in France, however, is not so much the number of motor cars held in readiness, as the fact that all of the chauffeurs are soldiers—that is, members of the first reserve—that they regularly receive military training, as well as lessons in French and cartography, and that they daily cross into France in their masters' automobiles, driving for days along the highways and byways of the frontier districts, learning the location of every farm, fence, road, hill and copse of woods. This accumulated information, the French claim, gives the Kaiser's minions a great advantage in case of a declaration of war, and the rapidity with which such large bodies of soldiers can be thrown into hostile territory at practically a moment's notice, is said to have caused the French general staff to pass a good many sleepless nights.



997,668. Vehicle Wheel. John J. Haines, Indianapolis, Ind. Filed June 9, 1910. Serial No. 566,074.

1. In a wheel, a felly having a plurality of elastic lugs thereon, reinforcing wires in the lugs extending circumferentially and also outwardly therein toward the periphery of the felly, a plurality of radially yielding spokes having each plate thereon seated against the end of a lug, each plate having two flanges engaging opposite sides of the lug, and securing devices engaging the lugs between the wires and the periphery of the felly and connected to the flanges of the plates.

997,675. Explosive Engine. Charles I. U. Hickling, Collingwood, Ontario, Canada. Filed Oct. 25, 1910. Serial No. 589,046.

An explosive engine comprising a cylinder, spacers projecting upwardly from the cylinder head, inlet and exhaust ports formed through the spacers into the cylinder, a casing surrounding the side of the cylinder and extending to the top of the spacers, a valve chamber supported on the spacers and top of the casing and separated by them from the cylinder head and having inlet and exhaust ports alined with those of the cylinder, said valve chamber forming with the casing a water jacket around the side and across the top of the cylinder, rotary tubular valves in the valve chamber having ports registering, during the rotation of the valves, with those of the cylinder, and means for causing the rotation of the valves.

997,702. Automobile Crank. Ide L. Bobbie, Woonsocket, R. I. Filed Sept. 23, 1910. Serial No. 583,498.

1. The combination with an engine shaft, of a clutch member mounted thereon, an operating crank rotatably mounted upon the clutch member, a locking pin carried by the crank and adapted to engage the clutch member, means for normally holding the pin in engagement with the clutch member, means for automatically retracting the locking pin against the action of said holding means, and means independent of the operator for locking said connecting pin in retracted position automatically.

997,708. Tire. Charles L. Schwarz, Philadelphia, Pa. Filed May 16, 1906. Serial No. 317,080.

1. In a tire, a rim composed of a felly band, an outer band, a cushion thereon, a pliable tread secured to said cushion, a plurality of springs between said bands, each of which is secured directly to said felly band at one end and the other end connected with the outer band, said springs extending circumferentially with their outer ends overlapped and movable on each other, and bolts passed through the overlapped portions of said springs, which latter have elongated slots, the outer ends of said springs being covered by the outer band and the outer ends of the bolts covered by and bearing against said cushion.

997,745. Detachable Rim Flange for the Wheels of Motor Cars and Other Vehicles. Thomas Edward Bridgman, Swansea, England. Filed Nov. 18, 1910. Serial No. 593,082.

1. A vehicle wheel comprising a felly with a plurality of holes; a detachable rim flange with a plurality of pins which take into the said holes, and are provided with reduced portions in their length and heads; a partially rotatable locking ring having elongated apertures with enlarged ends for the passage of the pins and engagement with the heads thereof, and lots of predetermined length; pins for attaching the locking plate to the said felly and which engage with the said slots; a permanently secured protecting cover plate inclosing the locking ring; said cover plate having a slot, a locking pin passing through the slot and engaging an opening in the rim flange, a plate having inner and outer flanges fitting in the slot, one edge of the plate being shaped to engage the pin and the inner and outer flanges engaging the walls of the slot, said pin and plate serving to hold the cover plate in locked position.

997,809. Tire Construction. Charles Nelson Harrison, Westfield, N. J. Filed Apr. 7, 1909. Serial No. 488,402.

1. The combination of a rim provided with annular bevels, rings engaging said bevels and provided with surfaces mating the same, other rings disposed adjacent to said rim and provided with flanges projecting partially over said annular bevels, a tire provided with oppositely disposed edges, each of said edges being disposed between a flange on the rim associated therewith, and means for clamping said edges between said flanges and said rings associated therewith.

997,829. Roller Bearing. Henry Buiser Keiper, Lancaster, Pa. Filed July 19, 1910. Serial No. 572,759.

1. A unit structure bearing comprising concentric ring-shaped bearing members, a circular series of axes between said members carrying a double corcular series of roller surfaces, a circular series of roller elements between said double circular series of roller surfaces having peripheral contact individually with the axes of adjacent pairs of roller surfaces for holding them apart, the outer bearing member having on its inner side annular marginal flanges confining said roller surfaces therebetween, and the inner bearing member having at opposite ends an exterior flange and means abutting said roller surfaces and together with said flanges holding the assembled parts together, said means adapting the inner member to be drawn out and thereby permit the bearing to fall apart.

997,834. Spring Tire. Joseph P. Kopetka, Bloomfield, Neb. Filed Nov. 22, 1909. Serial No. 529,231.

A tire comprising a plurality of narrow transversely bent wire sections arranged closely together, each of which comprises a semi-circular rim-engaging portion, a reduced central tread portion and curved laterally extending spring portions between the tread and the rim-engaging portion, and a plurality of longitudinally arranged fine reinforcing binding wires interwoven between the several transverse sections entirely around the tire including the rim-engaging portion.

997,837. Vehicle Wheel. Kern C. Laughlin, High Bridge, Ky. Filed June 1, 1910. Serial No. 564,533.

A vehicle wheel comprising a hub, an inner rim provided at intervals with openings circumferentially elongated, spokes connecting the inner rim with the hub, guide rods supported at their ends by means of the hub and inner rim, cross heads slidably mounted upon the rods,

springs mounted upon the guide rods and located upon opposite sides of the cross heads between them and the hub and inner rim, an outer rim, and spokes passed through the elongated openings of the inner rim and having their outer ends pivotally connected to the outer rim and their inner ends pivotally connected to the ends of said cross heads.

997,867. Spring. Arthur L. Snow, deceased, Kingfisher, Okla., by Grance Cunningham Snow, executor, Kingfisher, Okla. Filed Sept. 30, 1910. Serial No. 584,775.

1. In a device of the character described, a primary spring, a supporting member carried thereby, a supplemental spring pivoted to said supporting member and adapted to move idly with the primary spring for a predetermined distance, and a separate stop carried by said supporting member for limiting such movement of the supplemental spring.

997,887. Gas Motor. Sven Gustaf Wigeli, Eskilstuna, Sweden. Original application filed Feb. 9, 1906, Serial No. 300,336. Divided and this application filed Nov. 22, 1907. Serial No. 403,399.

1. A valve for combustion engines comprising a valve port leading to the cylinder of the engine, a valve co-operating with the port, a hollow stem closed by the valve, means to permit the valve to move longitudinally and relatively to the stem, means to supply fluid fuel through the stem when the valve is withdrawn from the port and a supply of air controlled by said valve.

997,917. Ball Bearing. Henry Hess, Philadelphia, Pa. Filed Oct. 17, 1908. Serial No. 458,183.

1. The combination of two bearing rings provided with ball races, balls in the races, one of the bearing rings being provided with a filling opening, and a plug having a depression in the path of the balls to relieve the parts of working pressure as the balls pass the plug.

997,920. Ball and Roller Bearing. Henry B. Keiper, Lancaster, Pa. Filed Apr. 18, 1910. Serial No. 556,204.

1. A unit structure bearing comprising concentric rings having confronting bearing surfaces, rollers arranged in concentric rows between said rings, and a row of balls between said rollers, adjacent pairs of rollers being held apart by a ball, one of said rings having annular parallel grooves in its bearing surface, providing a race-way for one row of rollers at each side, and an intermediate race-way for said row of balls, the other ring having means thereon at opposite ends co-operating with said grooved ring in holding the assembled parts together as a unit.

997,929. Carburetter. Charles F. Meyer, New York, N. Y., and Adolph J. Meyer, West Hoboken, N. J. Filed Dec. 6, 1909. Serial No. 531,633.

1. A carburetter comprising a casing, liquid outlets arranged in the base thereof, a plurality of separated air inlets arranged in the base of said carburetter adjacent to said liquid outlets, for conducting air thereto from opposite sides of said casing and partly across the path of said liquid outlets, a valve for controlling the passage of explosive mixture, and auxiliary air inlets first-named and said valve, substantially as specified.

998,128. Combined Air Pump and Cushion. Benjamin W. Smith, Montpelier, Ind., assignor of one-half to Thomas C. Neal,

Montpelier, Ind. Filed Feb. 3, 1910. Serial No. 541,795.

1. In a device of the kind described, the combination with a spring, of a pump cylinder connected to the pivot point of said spring; a piston mounted in said cylinder; a piston rod connected with said piston, and toggle arms connected to said spring having a loose connection to said piston rod.

998,157. Starting Device for Gas Engines. Gustave Chedru, Buffalo, N. Y., assignor to E. R. Thomas Motor Company, Buffalo, N. Y., a Corporation of New York. Filed Sept. 17, 1907. Serial No. 393,371.

1. A starting device for gas engines comprising a reservoir for storing a pressure medium, a conduit for connecting said reservoir with the engine cylinder, a valve for controlling said conduit having a casing provided with ports opening toward the reservoir and the engine cylinder, respectively, and a plug rotatable in the casing and having a port adapted to connect and disconnect the ports of the casing, means for driving the plug from the crank shaft of the engine comprising a counter-shaft intermeshing spur gears connecting the crank and counter shafts, a valve shaft composed of two sections, one of which is connected with said plug, intermeshing miter gears connecting the other section with the counter shaft, and a clutch for connecting and disconnecting the sections of the valve shaft, consisting of a toothed collar arranged in one section, a toothed sleeve splined on the other section, and means for moving said sleeve so as to engage its teeth with or disengage the same from those of said collar consisting of a spring operating to move the sleeve in the direction for coupling the clutch, and a lever engaging with the sleeve and adapted to move the same in the direction for uncoupling the clutch, substantially as set forth.

998,155. Valve. La Fayette E. Bowser, Fort Wayne, Ind., assignor to S. F. Bowser & Company, Incorporated, Fort Wayne, Ind., a Corporation of Indiana. Filed Feb. 3, 1909. Serial No. 475,889.

1. In a valve, the combination of a casing having a passage therethrough provided with an inlet and an outlet, a valve proper for closing the passage, a chamber supported by the casing and having communication with the passage on the outlet side of the casing, a piston movable in the casing, a stem connecting the valve and piston whereby suction through the outlet opening will operate directly upon the piston to

move the latter to open the valve, an elastic member surrounding the stem and tending normally to move the piston in a direction to close the valve, all of said parts being housed in the casing and chamber, and means for limiting the opening movement of the valve.

998,366. Tire Chain. Victor Mancini, Granville, N. Y. Filed Feb. 11, 1911. Serial No. 608,024.

In combination, a pair of flexible circumferential members, a plurality of separated tread elements having inwardly turned hooks, flexible connecting members having stirrups to removably engage said hooks, filler plates removably carried by the tread elements for holding said stirrups in engagement with the hooks, and connections between the flexible circumferential members and an intermediate portion of the connecting members.

998,172. Pump for Inflating Rubber Tires. Cyrus A. Haas, St. Louis, Mo. Filed July 2, 1909. Serial No. 509,422.

1. In combination with a rotatable member, a pump-cylinder oscillating about a fixed axis disposed parallel to the axis of the rotatable member, and provided with a reciprocating piston, a piston-rod leading toward the rotatable member from the piston, a pivoted cylinder support provided with suitable intake and discharge passage-ways establishing intercommunication between the interior of the cylinder and said passage-ways, a wheel on the support rotatable about a fixed center and having one face thereof coupled to the outer end of the piston-rod, the periphery of said wheel engaging the periphery of the rotatable member under a positive thrust exerted against the rotatable member through the wheel aforesaid, and means for connecting the wheel to the support from the side opposite the piston rod whereby the center line of said thrust will be brought in the plane passing through the center of the wheel and at right angles to the axis of rotation thereof, and a terminal member on the cylinder-support disposed in the line of thrust aforesaid, through which the thrust is exerted.

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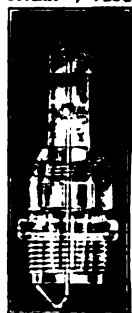
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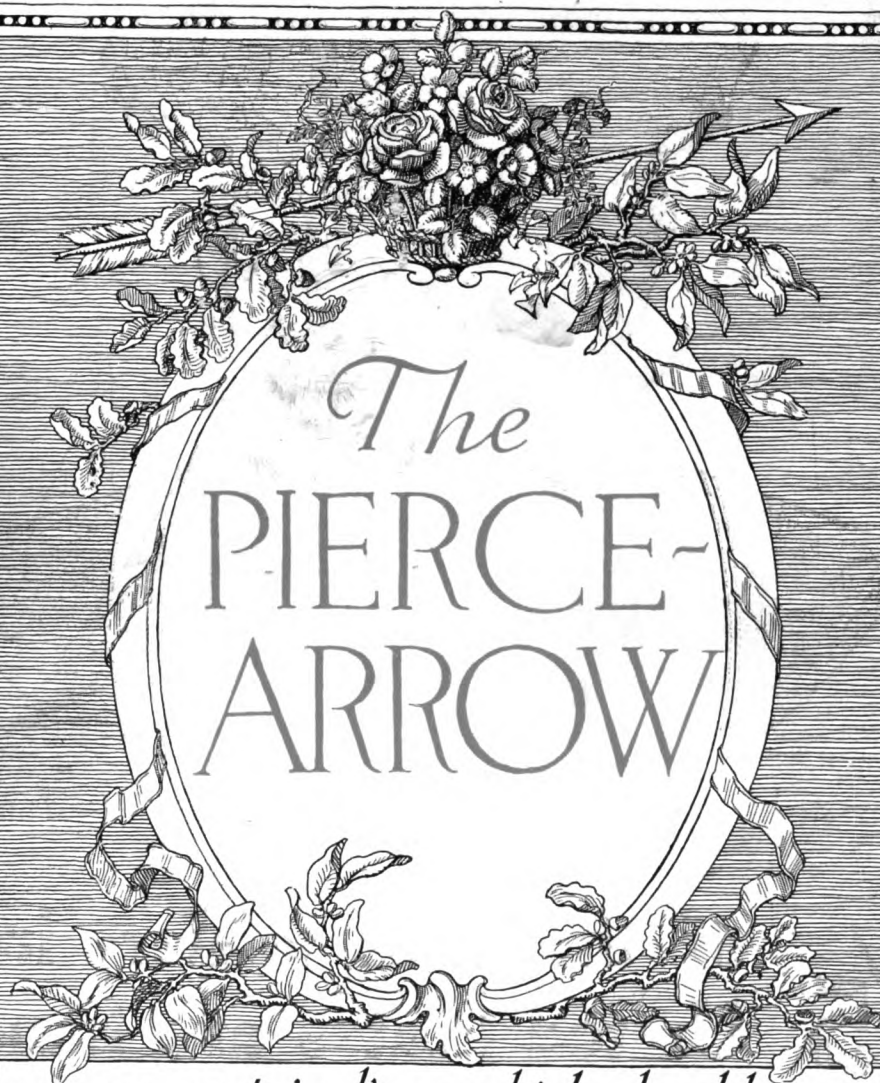
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 2

New York, January 4, 1912

Ten cents a copy
Two dollars a year



There are certain lines which should go with the building of an automobile body, just as there are certain lines that go with the building of a yacht. In the PIERCE-ARROW CARS for 1912 the automobile body has come into its own. These bodies have been built as automobile bodies—not as adapted carriage bodies. You will see the great difference at once. The PIERCE-ARROW MOTOR CAR CO., BUFFALO, N.Y.

Forecasts of the New York Shows



**4/5 of the best dealers in the
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These are unquestionably America's *Predominant* Tires, and dealers generally are fully awake to the fact, as indicated by the following extract from a letter recently written by a big dealer to a car manufacturer :

"The fact that this Company combines the experience of four of the largest tire concerns in the country, is certainly in their favor."

THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, January 4, 1912.

No. 2

SMITH TO BUILD COMPLETE TRUCKS

Milwaukee Parts Manufacturer Makes an Unexpected Move—Truck Sales Department Already is Organized.

The A. O. Smith Co., of Milwaukee, which is among the world's largest producers of automobile parts, and which of late years has gone heavily into the manufacture of truck frames and other commercial vehicle parts, in particular, is about to engage in the manufacture of the complete trucks themselves. In fact, the Smith plans to that end are so well in hand that a truck department already has been organized and placed in charge of O. M. Babcock who formerly was with the Kelly Motor Truck Co., and who will fill the office of sales manager. He assumed his duties on the 1st inst.

It was expected that the Smith truck would be ready for exhibition at the Grand Central Palace Show in New York next week, and space for its display had been engaged, but unavoidable circumstances served to slightly delay matters and the truck will not make its public appearance until the Chicago show. With the immense facilities at the command of the Smith company that it immediately will prove a real factor in the commercial vehicle industry almost goes without the saying.

Glidden Still in Dark About Merger.

That mysterious "contemplated merger" of which Charles J. Glidden was invited to become the head, has not become more definite, so far as Mr. Glidden himself is concerned. He was in New York yesterday and, in reply to the Motor World's inquiries, stated that he was as much in the dark as ever. The man who sought him out and asked him to consider becoming president of the merger and who promised to return with fuller information has not returned for Mr. Glidden's reply nor to supply the promised information. Mr. Glid-

den admitted that he was a Western man of prominence in the industry, but when the most likely name was suggested he replied the seal of confidence prevented him from giving either affirmation or denial, but he stated positively that he did not know whom his visitor represented, nor what companies it was proposed to consolidate. Unless it was to secure the use of his name, Mr. Glidden said he could not imagine why he had been sought out by the "mysterious" stranger.

New Firm Formed to Import Lancias.

The Hol-Tan Co., of New York, having relinquished the American agency for the Lancia car in order to devote itself wholly to the S. G. V. car, in which E. R. Hollander is heavily interested, the T. E. Adams Co. has been organized to continue the Lancia business in this country. The company is composed of T. E. Adams and E. Lillie, who have been engaged in the automobile importing business for a number of years. They will operate at 235 West 58th street, New York.

Twitchell to Build Factory in Michigan.

Following the inauguration of his Eastern campaign against alleged infringers, C. R. Twitchell, of Los Angeles, Cal., has joined hands with James Garvey of the same city, and formed the Twitchell-Garvey Mfg. Co., which will devote its entire attention to the manufacturing of the Twitchell air gauges. The company already has a factory at 706-768 North Main street, Los Angeles, and is making preparations to open another plant early next month in Lansing, Mich.

Palmer Leaves the Automobile Industry.

R. A. Palmer has resigned the general management of the Cartercar Co., of Pontiac, Mich. He, hereafter, will devote himself to the Franklin Provident and Savings System in which he has become interested. His successor has not yet been appointed and for the time being his duties will be performed by C. A. Trask and H. B. Radford, respectively factory manager and sales manager for the Cartercar Co.

REPUBLIC WINS NOBBY TREAD SUIT

Judge Hazel Sustains the Mell Patent and Decides Against Morgan & Wright—Bailey Tread Ruled Out.

Holding that though to the eye the Republic "Staggard" tread tire and the Morgan & Wright "nobby" tread look different, they are essentially duplicates, Judge Hazel, sitting in the United States Circuit Court for the Southern District of New York, on Friday last, ruled that the Morgan & Wright production is an infringement of the Tod J. Mell patent under which the Republic tread is produced, and which is controlled by the Republic Rubber Co., of Youngstown, Ohio.

The decision is the outcome of the suit filed by the Republic Rubber Co., against Morgan & Wright for infringement of the Mell patent, No. 898,907, dated September 15, 1908. In ruling that the patent is valid and though finding Morgan & Wright guilty of infringement and granting the injunction prayed for, Judge Hazel exempted the defendants from costs.

Originally the bill of complaint charged Morgan & Wright with the infringement of the Republic company's trade mark, "Staggard," and also with infringing claim 3 of the Mell patent, but these allegations were abandoned and the Republic case rested on the alleged infringement of the first claim of the patent which applied solely to the tire tread involved. Strangely enough, Mell's patent is specifically entitled "improvements on pneumatic rubber tires for bicycle wheels," but despite the fact, the court held that "it is evident that the tire was intended for use on automobiles as distinguished from bicycles and motorcycles, though the patent contains no such limitations."

Morgan & Wright interposed a strong defence, but it served no purpose. They quoted the patent on the well-known Bailey tread as an anticipation and made the most of it, and also brought to bear an English

patent issued to one Healey and which long since expired. But discussing them at considerable length, Judge Hazel said "that the gripping capacity of the studs" which was the desideratum of Mell's invention, was absent in both the Bailey and Healey treads. He dismissed as irrelevant all of the other alleged anticipations and ruled that although the studs of the Morgan & Wright treads are arranged obliquely, and in that respect differ from the Republic tread, they extend circumferentially in the direction of their length, and by such configuration substantially the same result is achieved. "The oblique arrangement, though perhaps more efficient," said the court, "does not void the claim." Judge Hazel's decision in full, is as follows:

This is an action in equity charging infringement by the defendant of letters patent number 898,907, issued to Tod J. Mell, dated September 15th, 1908, for improvements in pneumatic rubber tires for bicycle wheels. The patent relates to the tread-surface of pneumatic inflatable tubes. It was the object of the patentee to give his rubber tire superior road gripping qualities, to reduce to a minimum all side skidding tendencies in varying loads and road conditions, and also to make it durable and puncture proof. The bill also avers infringement of the complainant's trade-mark "Staggard," and enforces competition; in support of the allegations evidence is contained in the record; but such allegations and the asserted infringement of claim three of the patent have been dropped, and the complainant rests his cause upon the alleged infringement of claim one only, which reads as follows:—

"A tire for bicycle wheels provided with outwardly projecting circumferentially arranged elongated studs, each having inwardly diverging walls, a flat outer surface, and a relatively large base, specifically as described."

The claim is fairly descriptive of the studs on the periphery of the tire in that they are (1) outwardly projecting, (2) circumferentially arranged, (3) elongated, (4) with outwardly diverging walls, (5) a flat outer surface and (6) a relatively large base.

The studs are molded integrally with the top of the tire and placed in series around its surface. They have round ends with flat outer surfaces and divergent walls, and have break joints with the adjacent studs. They are arranged in zig-zag form across the tread-surface of the tire. The specification says the spaces between the adjacent studs are "outwardly diverging the better to clear the structure from mud and foreign matter that might otherwise accumulate and be compressed between said studs, thereby impairing their usefulness as anti-skid contrivances." It is evident that said tire is intended for use on automobiles as distinguished from bicycles and motorcycles, though the patent contains no such limitations.

The defendant contends that the patent is invalid; or if valid, that it must be limited to exclude defendant's tire from its scope; and generally denies infringement. Many prior patents for bicycle tires are in evidence and defendant claims that by such patents and publications it is shown that studs or projections on the outer surface of the tire substantially similar in construction and appearance to complainants and which operate in the same way, were old at the date of invention, and that by ap-

(Continued on Page 176)

NEW COMPANY FOUNDED ON FABRIC

**Zeglen Rights Secured and Big Tire Factory Being Built in Pennsylvania—
Dunbar the Prime Mover.**

The meaning and purpose of the American Rubber & Fabric Co., which was incorporated last April with \$1,500,000 in capital stock, have been made clear. Without fuss or feathers, the company has secured a plot 950 x 250 feet at Burrell, which is adjacent to Jeannette, Pa., on which it is now erecting a three-story factory, 150 x 100 feet, which will be ready for operation about April 1st. Previously the company had secured the rights to the Zeglen bullet-proof fabric and its immediate purpose is the production of Zeglen tires in which, of course, the Zeglen fabric will play the leading part.

Wilmer Dunbar, who had served with both the Diamond and Pennsylvania Rubber Co., is the moving spirit in the American Rubber & Fabric Co., and is the man who is whipping it into shape. He is its vice-president and general manager; Arthur B. Murphy is temporarily assisting him in the capacity of secretary and treasurer, but may retire when the new election occurs. No president has yet been chosen, but it is understood that one of several well-known Pittsburgh men, who are financially interested in the venture, will shortly be elected to that office. Zeglen tires themselves are not wholly new; they were exhibited at the automobile shows of three years ago by the company bearing that name.

Steinbock Gets His Company Started.

H. E. Steinbock, who recently retired from the engineering staff of the Maxwell-Briscoe Motor Co., to form a company of his own, has organized the Steinbock Engineering Co. and set up a temporary plant in Peekskill, N. Y., where he is putting the finishing touches to the four-cylinder 30-horsepower car which it is the company's purpose to place on the market. Two other well-known automobile men are said to be identified with Steinbock, but for the time being their identity will not be disclosed. It is expected that ultimately a factory will be secured in New Jersey.

How One Michigan Company "Paid In."

Owing to irregularities or peculiarities in the capitalization of the Whisler Mfg. Co., of Detroit, Mich., the affairs of the company are to be placed in the hands of the prosecutor by Allan Campbell, trustee in bankruptcy. The company was organized to make magnetos—but made few, if any, of them—with a capital of \$100,000, only \$10,000 of which was said to have been "paid in." When the company went into bankruptcy some time since, it was discovered that the so-called "paid-in" cap-

ital consisted of a check for \$6,500, drawn on the Port Huron bank, but which never had been applied for the purpose specified, and the whereabouts of which are now unknown, the remaining 3,500 of the "capital" being property. The liabilities of the company are given as \$1,535.92, against which the officers claim assets of \$1,537.23. The officers are: Walter Robinson, president; Ralph Whisler, treasurer, and W. Baker, secretary.

Arkansas Doctor to Make Decarbonizer.

Rogers, Ark., has been placed on the automobile map by the organization in that city of the Rogers Chemical Co., capitalized at \$25,000, which will produce a carbon remover styled "Decarbonizer," which is the discovery of Dr. F. L. Wallen, president and general manager of the company. His associates are J. W. Walker, vice-president; George D. Parks, treasurer, and Dr. G. H. Love, secretary.

Goodyear Erecting Two More Buildings.

The Goodyear Tire & Rubber Co., of Akron, O., is adding two more buildings to its already immense plant. One of the buildings will be 300 x 60 feet, five stories high, and the other 120 x 50 feet, six stories high. When the new structures are completed they will permit the company to increase its tire capacity from 2,200 to 3,500 casings per day.

International Truck Office Goes Uptown.

The general offices of the International Motor Truck Co., which controls the Saurer and Mack trucks, have been removed from the Hudson Terminal building to the Demarest building at Broadway and Fifty-seventh street, New York. They will occupy four floors, the ground floor serving as a salesroom.

Atwater Kent Purchases Two-Acre Site.

The Atwater Kent Mfg. Co., of Philadelphia, has purchased a two-acre site on Stenton avenue, near Fisher Station, in that city, on which it will erect a new laboratory and factory building. The plans for the new structure already are in hand and actual construction will be started as soon as possible.

General Motors Removes Its Headquarters.

The general offices of the General Motors Co., in Detroit, were removed last week from 127 Woodward avenue, to the new Boyer-Campbell building on Congress street, West. The new location is a central one, and faces the Wayne County Court building.

Fear-Naught Secures Factory in Paterson.

The Fear-Naught Tire & Rubber Co., of Paterson, N. J., has purchased the Cardinal silk mill building in that city. Some necessary changes will be made before the rubber machinery is installed and the production of tires undertaken.

NOVEMBER EXPORTS NEAR \$1,600,000

Trend Away from European Markets Becomes More Pronounced—Canada, However, Remains the Biggest Buyer.

Maintaining their long continued strength, the statistics of the exports for the month of November, 1911, serve to emphasize the shift from Europe to South America and Oceania, which became so pronounced during the past few months. Although there was a decided falling off in exports to four of the twelve geographical divisions, the gains in the other eight more than compensated for this loss, the total figures being 1,364 cars, valued at \$1,382,804, as compared with 675 cars, valued at \$818,054, sent abroad in the same month of the preceding year. At the same time \$214,638 worth of parts were exported, as against \$134,649 worth in November, 1910.

Of the various European countries only the United Kingdom registered a gain, its purchases amounting to \$334,151 worth of cars and parts, as compared with \$141,133 worth in the same month of the preceding year. One of the remarkable facts shown in the table is the low average value of the cars exported to France, Germany and Italy, which amounted to almost exactly \$600; in other Europe the average value rose to \$750, England to \$805, West Indies to \$1,180, Canada to \$1,400, and Mexico to \$1,600. The heaviest proportionate increase was shown by the United Kingdom, with 140 per cent.; followed by Asia and Other Oceania, with 118 per cent., and British Oceania, with 100 per cent.

During the eleven months ending November, 1911, no less than 13,560 cars, valued at \$13,990,931, were exported, as compared with 7,686 cars, valued at \$10,339,905, in the same period of the preceding year. In the same interval \$2,951,188 worth of parts were sent abroad, a gain of 60 per cent. over the \$1,804,436 exported in the eleven months of 1910. Canada still is the best customer, taking \$5,137,685 worth; followed by the United Kingdom, British Oceania, South America and Asia in the order named. The report in detail:

	November		11 Months Ending November		
	1910	1911	1909	1910	1911
Automobiles	\$818,054	\$1,382,804	\$6,385,600	\$10,339,905	\$13,990,931
Parts of (except tires)	134,649	214,638	800,982	1,804,436	2,951,188
Exported to—					
United Kingdom	141,133	334,151	1,903,764	2,639,304	2,741,524
France	39,770	12,684	817,771	719,527	425,714
Germany	7,131	6,584	172,095	330,129	118,710
Italy	9,593	2,445	223,570	365,115	194,784
Other Europe	102,583	15,264	312,565	744,545	650,642
Canada	258,715	366,774	2,262,247	4,681,098	5,137,685
Mexico	65,618	81,309	450,237	637,580	432,316
West Indies and Bermuda	31,949	32,440	290,924	353,715	303,434
South America	111,256	163,824	211,666	445,593	1,131,182
British Oceania	134,956	269,333	247,037	548,397	1,871,716
Asia and other Oceania	33,166	72,016	172,206	485,164	719,083
Other countries	16,833	25,980	122,500	194,174	264,141
Total	\$952,703	\$1,597,442	\$7,186,582	\$12,144,341	\$16,942,119

November a Good Month For Imports.

Imports of foreign automobiles into the United States, which last month took a sudden upward jump, after having been on the decline for nearly three years, continued to gain during November, 1911, the statistics for the month showing that 96 cars, valued at \$214,133 were brought to this country, as compared with 73 cars, valued at \$152,596 in November, 1910. During the same months parts valued at \$30,450 and \$15,634, respectively, were imported, showing a gain of 96 per cent. For the period of eleven months ending November, 1911, the records show the gains of the last two months were almost enough to offset the losses sustained earlier in the year, 869 cars, valued at \$1,871,414, being imported, as compared with 911 cars valued at \$1,901,655 in the same period of last year. France, though fast losing ground, still is the heaviest exporter to this country, with the United Kingdom, Other Countries, Germany and Italy following in the order mentioned.

Tire Exportations Now Total \$2,257,000.

Automobile tires to the value of \$177,210 were exported during the month of November, 1911, as compared with \$150,214 worth in the same month of the preceding year. For the period of eleven months ending November, the figures show that \$2,257,727 were sent abroad, but a comparison with last year's figures is not available, as the government did not list tires separately previous to July, 1910.

The Gibneys Separate Their Interests.

James L. Gibney & Bro., of Philadelphia and New York, have separated their solid tire and electric vulcanizer interests from their general supply business, and hereafter will conduct the latter under the corporate name, the Gibney Motor Supply Co. The manufacturing business will be continued under the firm style.

Exports of Engines Attain Strength.

Internal combustion motors for automobile use are, for the first time, included in the government export statistics for November, 1911. During that month there were exported 318 gasoline motors, valued at \$38,248.

MUST FIGHT FOR NAME "OVERLAND"

Former Canadian Agent Forms Company and Pre-empt's Trademark—Willys Denies Having Agreed to Build Factory.

Strange as it may seem, John N. Willys and the Willys-Overland Co., have been put to it to prove their right to use the name Overland, in Canada, at least. They already have set out to demonstrate this right, and in a fashion that is not unlikely to prove of more than passing interest.

The conditions that contributed to the situation are unusual and have given rise to some confusion. Until about two months ago Willys considered his rights in the premises to be secure, in fact, he apparently had no suspicion that this was not the case until the Motor World published the fact that there had been incorporated in the Dominion, the Overland Automobile Co. of Canada, Ltd., which, it was said, was seeking a factory site. Previously, that is, in June last, the Willys-Overland Co. had taken the first steps toward the formation of a Canadian company in order to overcome certain customs obstacles, but the transaction was never consummated, nor was the charter ever issued. Those who were aware that Willys had made a move of the sort, therefore took it for granted that the Overland Automobile Co. of Canada, Ltd., was Willys's own company, which, however, was far from the case. When the Motor World's item appeared it brought about a disclosure of the personnel of the Overland Automobile Co., of Canada, or, at any rate, the president of it. He proved to be George R. Rastall, who, operating under the style, the Canadian Overland Co., at Regina, Sask., once had the Overland agency for at least that part of the Dominion.

Before Rastall's connection with it was known, and when it was supposed that Willys contemplated the erection of a plant in Canada, the latter's views were sought and he promptly denied that he harbored intentions of the sort. Willys's denial of the fact aroused Rastall who declared that the incorporation of the Overland Automobile Co. of Canada, Ltd., was in pursuance with an agreement entered into between himself and Willys for the purpose of assembling Overland cars in Canada. He avowed that Willys had agreed to take one-half of the \$500,000 capital stock of the company, which he added "is fully organized and doing business, and is controlled absolutely by myself."

"You might state incidentally," he added in his communication to the Motor World, "that in addition to holding the charter under which we are operating we also own the sole right to manufacture Overland cars in Canada through the fact that we hold the Canada trade mark. You might state

also that the Overland Automobile Co. of Canada, Ltd., will commence the manufacture of Overland automobiles in Canada in the very near future, and while we, of course, prefer to assemble the products of the American company, we shall build our own cars if necessary."

When these statements were called to the attention of Willys, and he was asked to explain them, he entered an emphatic denial and branded them as "devoid of truth in any particular."

"I made no such agreement with Mr. Rastall as he refers to," said Willys. "I was not cognizant of the formation of the Overland Automobile Co. of Canada; I did not agree to take one-half of the capital stock of the company, nor has any arrangement ever been made or even seriously discussed with Mr. Rastall or his company regarding the manufacture of Overland cars at Regina. As a matter of fact, Mr. Rastall did not apply for the registration of the word 'Overland' until 21 days before the expiration of his sales agreement with us, and which at that time he was in a position to know would not be renewed. Furthermore, The Overland Automobile Co., of Canada, is not in active business today, as Mr. Rastall states is the case."

When the situation was fully disclosed and it was apparent that the right to the name Overland had been preempted in Canada by Rastall, the Willys-Overland people lost no time in starting the machinery necessary to recover their rights. George W. Bennett, vice-president of the company, was in Toronto last week, and retained counsel to prosecute the suit that will be filed. The proceedings will have for their end not merely the recovery of the right to the word Overland as a trade mark, but the cancellation of the charter of the Overland Automobile Co. of Canada, Ltd.

Bennett Enters the Willys "Voting Circle."

George W. Bennett, who already was vice-president of the Marion Sales Co., and vice-president and general manager of the Willys-Garford Sales Co., was last week elected vice-president of the parent of both—the Willys-Overland Co., in which for the past several years he has distinguished himself as general sales manager. Bennett is of such strong force and character and so capable that his further recognition by John N. Willys, and his entry into the "voting circle" of the big company causes small surprise to those who know him best.

Morrison Joins R. C. Hupp's Corporation.

A. E. Morrison, one of the veterans of the trade, who latterly has been acting as factory director for the Cole Motor Car Co., of Indianapolis, Ind., has resigned that office to become western sales manager for the Hupp Corporation, of Detroit. He will take up the duties at once.

PACKARD PROFITS TOP \$1,400,000

Annual Statement Shows the Big Company to Be in Excellent Condition—Earnings Equal to 14 Per Cent.

When the fiscal year of the Packard Motor Car Co., of Detroit, ended on August 31st last, its total resources aggregated \$16,110,756, of which \$166,971 was represented by cash on hand and which, according to the treasurer's report, which was made public this week, was increased to \$650,966 the following day. The total receipts during the year amounted to \$13,817,499 and disbursements to \$13,650,528.

The capital and surplus investment at the beginning of the fiscal year was \$11,927,611, the net gain for the year being 11.8 per cent. or \$1,406,410, which represents the net profit on the \$10,000,000 capital stock and which is equal to 14 per cent.; and this despite the fact that "wages have constantly increased during the year and are higher than ever before," to quote the report of Henry B. Joy, president of the company, which accompanies the financial statement. Mr. Joy also brings out that during the year there was paid out of the earnings in making additions to the plant the following: Real estate, \$22,775; machine tools, \$345,941.63; building equipment and fixtures, \$525,112.73; a total of \$893,829.36. Incidentally, Mr. Joy points out that the present floor space of the Packard shop is 1,642,212 square feet, and that in the month of August, when the maximum was reached, the total number of employees was 7,575, and the payroll \$524,407.

In detail the financial report of the treasurer, Philip H. McMillan, for the fiscal year which ended August 31st is as follows:

RECEIPTS AND DISBURSEMENTS

Cash on Hand September 1, 1910.....	\$ 650,966.10
Receipts During Fiscal Year:	
Accounts Receivable.....	\$11,340,267.99
All Other Sources.....	1,826,265.69
Total Receipts	\$13,166,533.68
Total	\$13,817,499.78
Disbursements During Fiscal Year:	
Accounts Payable.....	\$11,997,250.97
All Other Accounts, including all taxes	1,653,277.28
Total Disbursements	\$13,650,528.25
Cash on Hand August 31, 1911.....	166,971.53
Total	13,817,499.78

GENERAL BALANCE SHEET

Resources:	
Plant—	
Real Estate (at cost)	\$ 283,707.45
Buildings	1,945,849.72*
Machinery	1,061,623.72*
Equipment—Boilers, Engines, Generators, Motors, Elevators, Shafting, etc., etc.	1,011,160.76*
Fixtures	217,925.04*
Tools	250,000.00*
Paid on New Buildings in Progress	82,620.24
Rights, Privileges, Franchises, Development, Patents and Inventions....	3,412,958.89
	\$ 8,265,845.82

*—Depreciation for current year deducted, aggregating \$572,001.37.	
Investment in Branch Houses.....	1,272,410.48
Investment Account—	
50 Bonds C. & N. W. Ry. Co.....	\$ 46,625.00
50 Bonds C. B. & Q. Ry. Co.....	50,312.50
	96,937.50
Stock Option Contracts with Employees	112,200.00
Material Stock—	
Raw and in Process and Finished Vehicles	5,202,887.77
Current Assets—	
Cash	\$ 166,971.53
Vehicles in Transit to Dealers	372,712.36
Vehicles in Transit to Branches	325,973.93
Accounts Receivable	152,008.66
Bills Receivable	100,183.35
Expenses Paid in Advance	42,624.88
	1,160,474.71
	\$16,110,756.28
Liabilities:	
Capital Stock—	
Common Stock....	\$5,000,000.00
Preferred Stock....	5,000,000.00
	\$10,000,000.00
Payables—	
Bills Payable.....	\$1,155,000.00
Accounts Payable: Invoices, Accrued Pay-Roll, Vouchers not due, Deposits on Vehicle Orders, etc., etc.	1,703,265.33
	2,858,265.33
Reserves—	
Accrued for Depreciation, Interest, Taxes and Insurance	268,469.14
Surplus Aug. 31, 1911	2,984,021.81
	\$16,110,756.28

Shifts in the Studebaker Staff.

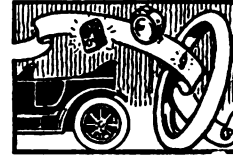
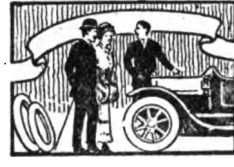
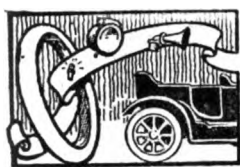
Frank H. Smith, previously manager of the company's Minneapolis branch, has been appointed assistant sales manager for the Studebaker Corporation E-M-F factory in Detroit. H. W. Miller also has entered the sales department taking over the duties previously performed by C. E. Stebbin who has been assigned to the management of the Studebaker branch in Sioux Falls, S. D. C. R. Newby, manager of the latter, has been transferred to Minneapolis to take charge of the Studebaker establishment in that city which previously was managed by Smith.

Hess Retires from Franklin Management.

Herbert Hess, who for the past five years has been associated with the Franklin Automobile Co., of Syracuse, N. Y., latterly in the capacity of general manager, has resigned that office to engage in the real estate, loan and insurance business. Two other former Franklin men are interested in the new venture—Stanley C. Kingsbury and Ralph C. Stilwell.

Kelly Becomes Republic's Sales Manager.

John H. Kelly, for nine years manager of the Republic Rubber Co.'s Chicago branch, has been promoted to the position of general sales manager of the company, at Youngstown, Ohio. He has been prominent in the Chicago trade for many years, being a director of the Chicago Automobile Trade Association.



W. H. Dudley is building a garage at Churdan, Ia. It will be 44 x 70 feet, of brick, one story high.

McKenzie & Bellows have opened a salesroom and garage in Whittier, Cal. They will handle Ford cars.

E. E. Russell has opened a garage at 822 Middlesex street, Lowell, Mass. It is large enough to store 35 cars.

M. H. Hayn, of Savannah, Ga., has opened a garage and salesroom at 213 Broughton street. He will display Cole cars.

The Rex Automobile Co., of St. Louis, Mo., has filed notice of a change of name to Empire Sales Co. Its salesrooms are located at 1631 South Jefferson street.

The Olds Motor Works, of Lansing, Mich., has opened a branch in Saginaw, in that State, at the corner of South Baum and James avenue. It is in charge of W. H. Watt.

The Yale Automobile Co., of Minneapolis, Minn., which hitherto only has done a repair and garage business, has taken on the sale of cars in addition. It will handle the Penn car.

The Remy Electric Co. has opened a branch station at 212 Lane street, Dallas, Texas. It will be in charge of N. A. Price, who formerly was in the New York office of the company.

W. W. Wurzbarger, formerly a member of the Pioneer Commercial Auto Sales Co., of Los Angeles, Cal., has become sales manager of the Moreland Motor Truck Co., of the same city.

Breazeale & Smith have opened salesrooms in Jacksonville, Fla., where they will display Schacht pleasure and commercial cars. They have the distributing agency for the whole State.

Sever Johnson, a retired farmer of Sharon, N. D., has purchased the Sharon Auto Garage, formerly owned by J. E. Brua and L. O. Harmon. He will continue the business under the old style.

The Crist Motor Sales Co. has been formed at Toledo, Ohio, for the distribution of Cole cars in Northwestern Ohio, and for the local sale of the Union "25" roadster. H. H. Crist is the manager.

The Hartford Suspension Co., manufacturer of Truffault-Hartford shock absorbers and the Hartford jacks, has opened a branch in Kansas City at 1524 Grand avenue. Henry Roemer is in charge of it.

John R. Jones has purchased the Rome Motor Car Co., of Rome, Ga., from A. R. Sullivan. Varnell Chambers will be manager of the new company, which will han-

dle E-M-F, Flanders, Hudson and Whiting cars.

W. H. Stevens, who for years was identified with the Stoddard-Dyton Sales Co., Boston, Mass., has gone into business on his own account and opened salesrooms at 642 Beacon street. He will handle National cars.

J. R. Jackson, of Grand Rapids, Mich., one of the partners in big tailoring firm of Jackson & Verkerke, has forsaken the clothing trade and purchased an interest in the Stratton-Woodcock Automobile Co., of the same city.

The Munger Auto Co., Cadillac agent in Dallas, Texas, is preparing to build a three-story reinforced concrete building on Commerce street, near Pearl street. It will be 50 x 90 feet, and especially equipped for the handling of automobiles.

The International Harvester Co. has broken ground for a service department and garage at 1814 Michigan avenue, Chicago, Ill. Until the building is completed International cars will be cared for in temporary quarters at 1329 Michigan avenue.

Having decided that he preferred farming to repairing automobiles, M. C. McIntosh has traded his new garage at Greely City, Kans., for a farm. The new owner is S. A. Blair, a farmer of Gill, Kans., but the garage will be managed by his son, H. C. Blair.

The Ford Automobile Co., is the style of a new company which has opened a garage and salesroom at 115 North Third street, Grand Forks, N. W. W. Dale Wolf is the manager of the concern, which, as the name indicates, will handle Ford cars exclusively.

The Auto Exchange & Supply Co. has opened up at 1710 Fourteenth street, N. W., Washington, D. C., where Bergdoll cars are to be shown, in connection with a full line of accessories. R. H. McKnew is president of the company, and B. S. Boteler, secretary-treasurer.

The Elmer Automobile Co. has opened new salesrooms at the corner of Trumbull and Church streets, Hartford, Conn., where Ford cars will be shown exclusively. The company is one of the oldest automobile houses in Connecticut, having sold Fords for the past six years.

Under the style the Whitney-Barney Co., a new concern has been formed in Boston, Mass., with C. F. Whitney and C. H. Barney as the moving spirits. They have opened salesrooms at 823 Boylston street, where they will show Selden and Lion pleasure cars and Gramm trucks.

Two new garages have been erected in Ontario, Cal., during the past week. D. B. Wynne is owner of one, in which he displays E-M-F and Flanders cars, while the other is the property of F. A. Saunders, on Laurel street, where a storage and rental service will be inaugurated.

Walter R. Simkin, of Chicago, Ill., has organized the Simkin Mfg. Co., with salesrooms at 1507 Michigan avenue. He will specialize in a patented device for lighting automobile lamps from the seat, called the Daisy Gas Lighter. Simkin for four years has been manager of the Chicago Rambler garage on Sheridan road.

The Buick Auto Co. has been incorporated with a capital of \$5,500 to take over the Saunders Garage at the corner of South Division and Pleasant streets, Grand Rapids, Mich. As the name implies, Buick cars will form the mainstay of the company, although other cars of the General Motors Co. also will be carried.

Leon T. Shettler, who sells Apperson cars in Los Angeles, Cal., has incorporated his business under the style Leon T. Shettler Co., and taken Captain G. W. Neuls, of Redlands, Cal., as partner. He will build a salesroom and small garage on Pico street, but will retain his present service building on Washington street.

The Morse-Readio Auto Co., which last week was incorporated with a capital of \$150,000, is preparing to build an immense five-story, steel and concrete structure on Dwight and Chestnut streets, Springfield, Mass. The building will be 200 x 129 feet, and will house the various trucks made by the General Motors Co., of Detroit, for which the Morse-Readio company has the distributing agency.

Joseph E. Bulen, formerly president of the Swash Motor Co., of Columbus, Ohio, has filed suit against George H. Miller, receiver for the company, for \$11,714.05. He charges that loans were made by him to the defunct company, amounting to \$9,438.41, which are said to be unpaid. He furthermore demands \$2,275.64, which includes his salary as president of the company and sundry rents due him.

V. W. Knapp, cashier of the State Bank, Long Lake, Minn., has purchased the interest of Milton D. Brice in the Regal Sales Co., of Minneapolis, Minn., and incorporated the company with a capital of \$25,000. J. P. McGuire, sales manager of the old Regal Sales Co., has become general manager of the incorporated concern, while Brice expects to go into business on his own account. Temporarily, the latter has become sales manager of the new company.



Dover, Del.—Motor Owners Tire Co., under Delaware laws, with \$300,000 capital; to manufacture and deal in automobile tires.

Cilo, S. C.—Hubbard Motor Car Co., under the laws of South Carolina, with a capital of \$3,000. Corporators—J. L. Hubbard, Hugh McLaurin.

Augusta, Me.—Union Motor Sales Co., under the laws of Maine, with a capital of \$200,000; to manufacture and deal in motors. Corporators—E. M. Leavitt, and others.

Los Angeles, Cal.—General Motor and Truck Co., under the laws of California, with a capital of \$75,000. Corporators—J. Galvin, C. A. Gore, W. C. Hotz, and others.

Springfield, Ore.—The Springfield Auto-truck Co., under Oregon laws, with a capital of \$20,000; to manufacture commercial vehicles. Corporators—F. D. Tower and others.

Chicago, Ill.—Packard Auto Livery Co., under Illinois laws, with \$1,000 capital; to do a general garage business. Corporators—F. M. Johns, N. A. Zimmerman, Abram L. Myers.

Oak Park, Ill.—Harvey Taxicab Co., under Illinois laws, with a capital of \$2,500; to do a general garage and automobile business. Corporators—Paul D. Harvey, Alice M. Dunlap.

San Francisco, Cal.—The Republic Rubber Co., of California, under the laws of California, with a capital of \$20,000. Corporators—M. E. Murphy, T. W. Swift, and Neal Brown.

Boston, Mass.—Rex Motor Co., under Massachusetts laws, to deal in automobiles and supplies. Capital, \$1,000. Corporators—Harold C. Stetson, Henry W. True, C. Frank Moore.

Springfield, Ill.—John A. Bender Co., under Illinois laws, to do a general automobile commission business. Corporators—John A. Bender, Charles W. Andrews, Adolph Traub.

Greensboro, N. C.—Ford Garage and Sales Co., under the laws of North Carolina, with a capital of \$10,000. Corporators—R. L. Markham, W. H. McGlamery and W. M. Combs.

Chicago, Ill.—Lee Motor Co., under Illinois laws, with a capital of \$50,000; to deal in automobiles and accessories. Corporators—Clarence A. Anderson, Oscar J. Lee, Robert G. Henderson.

Salem, N. J.—Blue Ribbon Automobile Service Co., under New Jersey laws, with \$25,000 capital; to do a general garage business. Corporators—G. B. Sheppard, J. D. Sharman, F. E. Hurley.

New York City, N. Y.—Hewitt Motor Co., under New York laws, with \$1,000,000 capital, to manufacture and deal in automobiles. Corporators—A. Ames, R. E. Henley, J. O. Wingrave.

Milwaukee, Wis.—The Automatic Motor Devices Co., under the laws of Wisconsin, with a capital of \$1,000; to manufacture accessories. Corporators—H. B. Webb, C. J. Delafield, J. E. Hurtubise.

Boston, Mass.—Whitney-Barney Co., under Massachusetts laws, with a capital of \$100,000; to deal in automobiles. Corporators—C. F. Whitney, Newtonville; C. H. Barney, Boston, and others.

Springfield, Ill.—Swanson Motor Car Co., under Illinois laws, with a capital of \$50,000; to deal in automobiles and supplies. Corporators—Chas. E. Swanson, Elmer E. Challenger, Marshall E. Gallion.

Los Angeles, Cal.—Motor Car Equipment Repairs Co., under California laws, with a capital of \$20,000; to do a general automobile business. Corporators—E. E. Forstall, Benjamin Waterfall, Z. K. Forstall.

Buffalo, N. Y.—Frontier Motor Car Co., under New York laws, with a capital of \$5,000; to engage in a general automobile business. Corporators—Elmer Harris, Winfield Graham, and V. L. Hagstrom.

Portland, Me.—Morrill & Higgins Motor Co., under Maine laws, with \$10,000 capital; to deal in automobiles and accessories. Corporators—Fred S. Higgins, George A. Morrill, A. D. Higgins, Eben Winthrop Freeman.

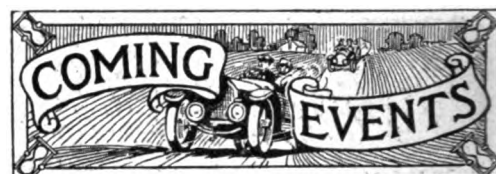
New Haven, Conn.—The Lale Auto Garage Co., under Connecticut laws, with a capital of \$1,000; to do a general garage business. Corporators—Thomas P. O'Connors, Simeon W. Crampton and Samuel Smernoff.

Kansas City, Mo.—White Motor Co., under the laws of Ohio, with \$100,000 capital; to manufacture internal combustion motors. Corporators—E. C. Rock, J. B. Seymour, E. A. Williamson, L. M. Lamoreaux, J. Rupydyke.

Wilmington, Del.—New Garage & Electric Co., under Delaware laws, with a capital of \$50,000; to manufacture and deal in automobiles. Corporators—Gottlieb Fader, Edna C. Fader, A. Franklin Fader, all of Newark, Delaware.

New York, N. Y.—Parker Motor Wagon Co., under the laws of New York, with \$10,000 capital; to manufacture and deal in motor vehicles. Corporators—Henry C. Cottfried, of St. Louis, Drew McKenna, of Brooklyn, N. Y.; Chas. E. Wood, of New York.

Trenton, N. J.—League of American Automobilists, under New Jersey laws, with a capital of \$10,000; to aid in the establishment of uniform automobile laws. Corporators—Harry N. Goldsmith, and S. Leon Canz, of Philadelphia, and Frank Voight of Camden.



December 30-January 6, Buffalo, N. Y.—Buffalo Automobile Trade Association's annual show in 74th Regiment Armory.

January 2-10, New York City, N. Y.—Importers' salon at Hotel Astor.

January 6-13, New York City—Automobile Board of Trade's 12th annual show in Madison Square Garden. Pleasure vehicles only.

January 9, New York City, N. Y.—Automobile Board of Trade annual meeting.

January 10, New York City, N. Y.—Motor and Accessory Manufacturers annual meeting.

January 10-13, Peoria, Ill.—Peoria Automobile Club's show in the Coliseum.

January 10-17, New York City—National Association of Automobile Manufacturers' 12th annual national show in New Grand Central palace. Pleasure and commercial vehicles.

January 11, New York City, N. Y.—Motor and Accessory Manufacturers annual banquet at Waldorf-Astoria.

January 13-19, Milwaukee, Wis.—Milwaukee Automobile Dealers' Association's annual show in Auditorium.

January 13-27, Philadelphia, Pa.—Philadelphia Automobile Trade Association's annual show in First and Third Regiment Armories.

January 15-20, Toledo, Ohio—Toledo Automobile Dealers' Association's annual show in Terminal Railway Building.

January 15-20, New York City—Automobile Board of Trade's 12th annual national show in Madison Square Garden. Commercial vehicles only.

January 18-20, New York City—Annual meeting of the Society of Automobile Engineers.

January 22-27, Providence, R. I.—Rhode Island Licensed Automobile Dealers' Association's show in the State Armory.

January 22-29, Detroit, Mich.—Detroit Automobile Dealers' Association's annual show at Wayne Garden.

January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.



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BUILDING EXPORT BUSINESS THAT ENDURES.

As practically everyone engaged in the trade is reaching out for foreign orders, the detailed and unusually intelligent and comprehensive report of the American consul at Erfurt, Germany, which is printed in another column, merits careful digestion. While it applies wholly to Germany and German conditions, in large measure it applies to the whole world. The methods described will win trade anywhere.

At this moment the American car is in high feather abroad. It is no great trouble to secure orders for them, but it is exceedingly questionable whether the methods which now obtain in this country will prove of avail when the high feather stage is past. Generally speaking, it is questionable whether American export methods make for enduring business. It is greatly to be feared that too many American manufacturers consider export trade merely as an excellent stop-gap and a ready medium for taking care of their surplus product. It is the history of many trades. It is the history of the bicycle trade, from which it is not easy wholly to dissociate the automobile industry. The American bicycle once was paramount the world over. Its volume of foreign business placed it at the head of the bicycle exporting nations; but it toppled from its high estate and now trails at the foot of the list, although at the same time the bicycle exports of Germany and of England have gone on and on and on to greater heights. The business of the American manufacturer was not upreared on an enduring basis. When the world was crying for bicycles, orders came to him abroad unasked or at the expense of small effort. When the cry ceased, the orders, not the foreign use of bicycles,

ceased. Having built on sand, the American maker then lacked the strength to "go after" the business.

The automobile trade properly can study the causes which contributed to this result. Usually it will be found that the American manufacturer expects to build Rome in a day and to have it endure forever. He is too prone to make haste in time of prosperity. He too seldom puts himself in the other fellow's place. He is not willing to spend the time, or the money, or both, to effect permanent results. He will not learn that the same methods and the same treatment which achieve results in America are the same methods and the same treatment that will bring results abroad. He well knows what would happen did he receive communications or printed matter in a language foreign to his understanding or what progress would be made by one unfamiliar with the English language and unversed in American ways who sought to interest him. He knows that at home he holds business by the expenditure of both time and money and by keeping his representatives constantly circulating; yet he expects one visit or two to forever hold trade abroad. He fails to appreciate that human nature is pretty much the same the world over and that usually it is wise to occasionally put oneself in the other fellow's place and view things from that standpoint. The manufacturer who does this sort of thing and acts accordingly is the one whose export trade will endure beyond the boom or "easy order" stage. All other methods are mere makeshifts—mere stop-gaps.

TO END THE HORN-TOOTING NUISANCE.

Chicago is in a fair way of solving the horn-tooting nuisance. It has enacted an ordinance which specifies not only when the horn shall be sounded but how it shall be sounded, which really is all that is necessary to put an end to the evil, provided, of course, the police do their full duty in the matter.

The Chicago ordinance provides that it shall be unlawful for any person to use any device which will not produce an abrupt sound and that such signaling devices shall be used only as a warning of danger, which plainly means that the chauffeur, the roysterer, or the gay young blade, who fancies that leaving a trail of noise in his wake is as agreeable to the public as it is amusing to himself, will be stopped short whenever the Chicago police are of a mind to stop him. It also means that a way has been found to reach the homecoming chauffeur who grates on the nerves of a neighborhood by sounding his horn until the doors of the garage are opened to him, which is one of several things which make a garage in a residential neighborhood a nuisance.

It is hoped that the police and residents of Chicago will make the most of the means which have been placed at their command. It will require but a few arrests under the new ordinance to put an end to an evil which has become almost intolerable not only in Chicago but wherever automobiles are used.

While the automobile itself is subjected to much abuse, nothing with which it is equipped is more abused than the horn. This abuse—this promiscuous horn-tooting—is the mainspring of much antipathy which is well deserved. There is small reason why the abuse should exist or be suffered to continue. The horn is designed for a well defined purpose—to sound a warning. Its mission begins and ends there. Chicago has shown the way to confine it to the mission for which it is designed. A general multiplication of the Chicago ordinance will serve the automobile interests to advantage and materially assist in relieving a long suffering public.

Cars to be exhibited in Madison Square Garden January 6 & 13

GASOLENE PLEASURE CARS

Alco	Maxwell
American	Mercer
Amplex	McIntyre
Atlas	Mitchell
Brush	Moline
Buick	Moon
Cadillac	National
Cartercar	Oakland
Case	Ohio
Chalmers	Oldsmobile
Columbia	Overland
Corbin	Packard
Courier	Palmer-Singer
Elmore	Peerless
E-M-F	Pierce-Arrow
Everitt	Pope-Hartford
Flanders	Premier
Franklin	Pullman
Garford	Reo
Haynes	S. G. V
Hudson	Selden
Inter-State	Simplex
Jackson	Speedwell
Knox	Stearns
Locomobile	Stevens-Duryea
Lozier	Stoddard-Dayton
Marmon	Thomas
Matheson	White
Marquette	Winton

ELECTRIC PLEASURE CARS

Baker	Flanders
Detroit	Waverley

Vehicles to be exhibited in Grand Central Palace January 10 & 17

GASOLENE PLEASURE CARS

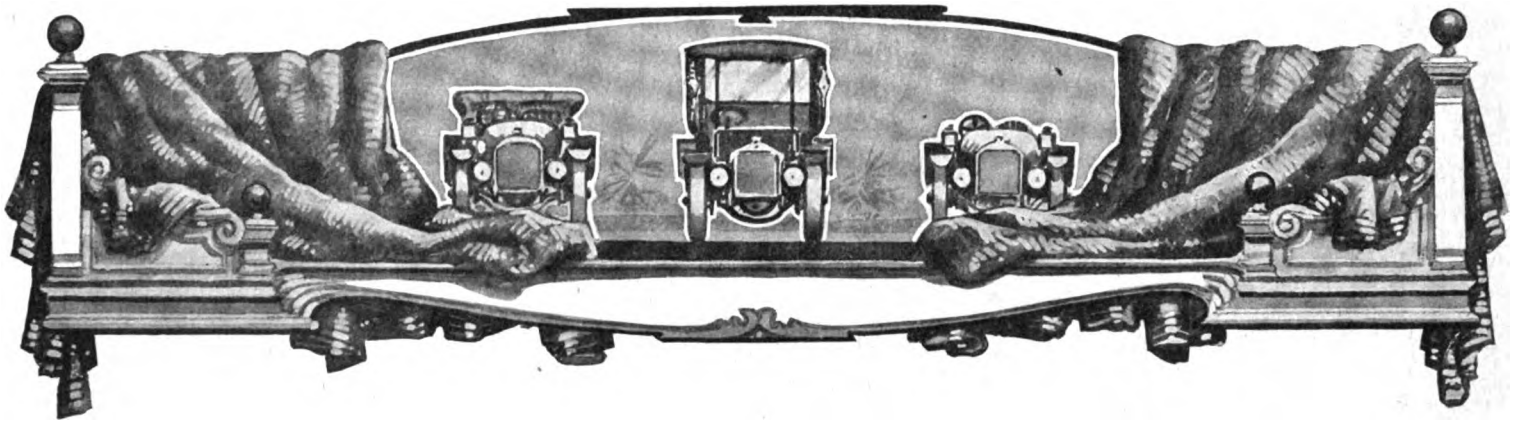
Abbott-Detroit	Krit
Ames	Lion
Auburn	McFarlan
Bergdoll	Marion
Cino	Metz
Colby	Middleby
Cole	New Parry
Crow-Elkhart	Ottomobile
Cutting	Paige-Detroit
DeTamble	Paterson
Fiat	Penn
Firestone-Columbus	Pratt-Elkhart
Great Western	R. C. H.
Havers	Rambler
Herreshoff	Regal
Hupmobile	Stutz
Imperial	Stuyvesant
King	Velie
Kline	Warren-Detroit
	Westcott

COMMERCIAL VEHICLES.

Aries	Lauth-Juergens
Atterbury	Maxim
B. G. O.	Maximus
Best	Motor Wagon
Chase	Newark
Cortland	New York
Commer	Packers
Dart	Parker
Dayton	Rassel
Decatur	Sanbert
Eclipse	Schacht
Federal	Stuyvesant
Gramm	Sullivan
Kelly	Universal
Knickerbocker	Velie
Koehler	Veerac
Lippard-Stewart	Walter

ELECTRIC VEHICLES.

Argo	Standard
Babcock	Walker
Colonial	Waverley



THE GARDEN SHOW AND WHAT IT HOLDS IN STORE

Little That Is Radical Likely to be Disclosed—Knight Engines and Developments in Coupes and Berlines the Principal Promises but Display of Accessories Will Hold Much Novelty.



THE MADISON SQUARE GARDEN SHOW AS IT WILL APPEAR IN ITS ORIENTAL SETTING

For the first time a tinge of sorrow will accompany the opening of an automobile show in Madison Square Garden, New York—the one which will be inaugurated Saturday evening next, 6th inst., under the auspices of the Automobile Board of Trade. It will be the last show of the sort to be held within the famous and imposing structure, which soon after will be razed to the ground to make way for a more profitable office building.

Countless shows of every nature have

been held within its four walls, but to the automobile industry alone Madison Square Garden has been the old homestead, so to speak. It housed it as an infant; it saw it creep, then toddle, then walk and finally don seven league boots and become one of the wonders of the universe. And now the old homestead is to be destroyed! Wherever there is sentiment—and sentiment, they say, rules the world—such impending destruction cannot but carry with it a pang of regret. Small wonder the chief musicker

will cause his band to play a special composition, "Farewell, O Garden!"

But in the glories to come, regrets will pass and will be forgotten. They will affect not at all the splendor and importance of the show which opens on Saturday. It will be the twelfth of its line, and undoubtedly it will prove the best and the biggest of them all. It will contain more cars and more varieties of cars than any show that went before; for there is no Selden patent longer to divide the trade, which for once

is united and at peace with itself; and there will be more accessories, too, and more varieties of them.

In all there are booked 400 exhibitors, of whom 56 will stage gasoline cars and four electric cars; while 18 makes of motorcycles will be on view. The other 322 will display accessories. This is without regard to the second week, when trucks and accessories will be shown.

That it will be a handsome show goes without saying; for many years all Garden shows have been of the eye-pleasing sort; the one about to open will be no exception to the rule. Last year's was the "great white show," this year red and gold will be the dominating hues in the color scheme. Officially, the decorative theme is styled an "Oriental Garden," but probably by any other name it would smell as sweet and look as well, and be more easily recognized; the Oriental character will not be very pronounced.

Entering the foyer from the Madison avenue entrance, the visitor will find himself in this oriental garden, dotted with recessed plaster figures and surrounded with hedges. Passing into the main hall he will find himself beneath what appears an oriental canopy of red and gold. The canopy, however, is a painting—one of the largest ever made, and weighing more than three tons; it will cover the entire ceiling and hang down over the sides of the top gallery.

Immediately within the main hall, will be a huge fountain backed by a statue representing the "motor era," while about the fountain are eight allegorical figures ten feet high arched by garlands of natural flowers. Six bay trees are recessed in the front of the fountain. Beyond this fountain will extend the main display space.

The elevated platform and balcony above the arena boxes will project over the main floor, forming a sort of mezzanine floor. For the edges of the elevated platform and balcony special railings have been designed, which, like the stairways, standards and decorative borders, will be finished in gold. In the general view these railings of the platform will rise in three rows in front and rear, and two rows on each side of the interior.

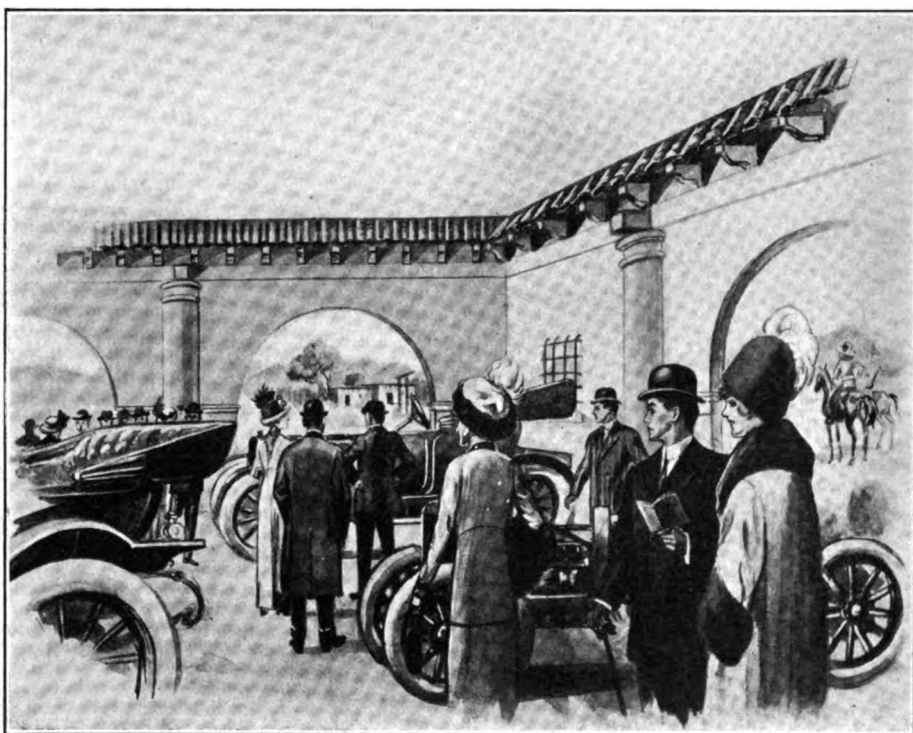
Along both sides of the arena will be boxes similar to those of the horse show, which will seat 1,200 people. Extending about the arena, towering to the dome, will be a number of ornate steel columns, which are expected to lend much to the stateliness of the whole effect. These columns support the balconies.

The "exhibition hall" will be transformed into a Patio. Here the exhibits will appear in a "Lower California" setting. A big pergola will extend about the room. This pergola is supported by Doric stucco columns and is topped on one side with a tile roof. The center of the room is open except for a miniature pergola which is topped with cross beams entwined with

foliage. A blue sky effect is afforded by peering upwards through the beams. A mammoth painting, depicting California scenery, will extend about the four walls of this room.

The "concert hall" will be transformed into a veritable cherry garden. The visitor will be under a canopy of cherry blossoms, in full bloom, so dense that nothing can be seen beyond the branches of the trees. Incidentally, the branches will be real. Along the walls of the room will be a Japanese panorama with Fujiyama, the sacred mountain of Japan, a feature of the scene. In the basement will be found a Bodega. A big mirror will add width to this room and Spanish scenes can be viewed by the visitor through big arches.

speak, and the first opportunity afforded for an intimate and complete comparison. A comparison will make plain that though the Stearns company boldly cast out the poppet valve motor, it did not slavishly follow the Knight design. The Stearns-Knight motor has a cylinder head of new design, in which provision is made for one spark plug only, instead of two, as in the original Knight models, dual ignition being employed. An entirely new carburetter has been designed for this engine, and slight changes have been made in the oiling system, which, however, in the main is of the so-called "movable dam" type that is standard with all Knight motors. In the designing of the Columbia-Knight engine, the inventor himself was consulted and his



"EXHIBITION HALL" TRANSFORMED INTO A LOWER CALIFORNIA PATIO

Without reference to cars of foreign manufacture, there were six cars shown in the Garden in 1911 that will not be seen there this year. The Regal and the Hupmobile will be at the Palace, the Kissel will have a private show in its own stores, and the Midland, Chadwick and Royal Tourist will not be shown.

Of the older members of the Board of Trade, few will display productions of a radical nature or embodying radical innovations. Perhaps those that come nearest to being placed in this category are the Stearns, Columbia, Stoddard-Dayton and Atlas companies, the first of which will employ the Knight sliding sleeve engine exclusively, and the other three in at least one model each, will use that once despised but now accredited power producer.

While the details of these models have been much discussed, it will be the first time they have appeared in public, so to

ideas carried out; not only this, but the company sent abroad for castings for cylinders, sleeves, pistons and rings in order to be sure of these very important components. The Columbia company, unlike the Stearns, still retains the poppet valve in all but one model.

The Stoddard-Dayton company has the distinction of building the only Silent Knight "six" that will be seen at the show, and, in fact, the only motor of its type so far built in this country. The "six" will be the only Knight model shown by the Stoddard-Dayton company, its other models being of their usual type of poppet valve construction.

Well known as manufacturers of two-cycle cars, the Atlas company will display a notable creation which will mount not only a four-cylinder four-cycle Knight motor, but will be distinguished by worm drive, speed-change gear on the rear axle,

center control and left-hand steer—a combination that is a genuine novelty. Other Atlas models will employ the regular Atlas two-cycle motor with rotary valve in the crankcase, as heretofore.

Of the makers of six-cylinder cars, well over a score in number, who will exhibit at the Garden show, six are showing "sex-tuplets" for the first time—the Chalmers, Garford, Packard, Pullman, Stoddard-Dayton and White companies. Of the older makers of "sixes" several have added to their lines new six-cylinder models. In this category comes the Franklin company, which has brought out a new 30-horsepower "six"; also the Locomobile company, whose new 38-horsepower car is practically a reduced-scale replica of last year's

casting in threes, the Stoddard-Dayton six-cylinder engine being of this type.

The show will disclose a surprising number of manufacturers who have added to their lines of four-cylinder cars. For instance, there will be a new and less costly member of the high-priced "valveless Amplex" family—the "Baby Amplex," while the underslung American principles will be embodied in a new two-passenger model that will sell for \$1,250. No less than six new models have been added to the Cadillac line, all the new machines being on 40-horsepower chassis and all equipped with electric engine starters. The Haynes company also has brought out a 40-horsepower model and added an inside-driven coupe, a speed car and a limousine to its line.

hibited coupes at previous shows, they will have newly-designed vehicles of this type at the Garden. The Berline, or double limousine—"the parlor car on pneumatic tires"—has made progress, and has reached a point where it would seem that luxury on wheels can be carried no further. The Fierce-Arrow, the Stevens-Duryea, the Stoddard-Dayton, the Knox, which were displayed last year and which have been still further refined, have been reinforced by others, among them the Alco, the Peerless, the Premier, the Chalmers, and the Matheson.

Practically all touring cars staged will be of the now standard closed-front type, and the logical development of the closed front body—the skuttle dash—will be found to have almost but not quite driven out the old vertical dash.

Partly as a result of the adoption of the closed-front body and partly as an outcome of the general movement toward increased convenience and simplicity of operation, control levers very generally have been placed inside the body, and their removal from the outside has a decidedly pleasing effect on the appearance of the car as a whole. There will be seen few cars in which the chauffeur will have to qualify as a contortionist in order to manipulate the change speed and brake levers on account of their outside position.

There will be noted a distinct tendency toward the placing of the control levers in the center of the car, so that entrance can be effected from either side. In several instances center control is coupled with left-hand steering—a practice that is evidently gaining ground. Center control and left-hand steer will be found in the new Stoddard-Dayton Knight car, to name a notable example, and center control on the Overland and Matheson, among others. White, Knox and Reo cars will be shown with left-hand steering.

Never have cars been so clean and lacking in that "fussy" appearance engendered by the presence of numerous fittings and accessories attached to the dash and to the running-board. Self-contained lubricating system have eliminated the necessity for sight-feeds on the dash, and coil boxes in many cases are made unnecessary by the use of high-tension magnetos. Even where there are fittings on the dash they are at least partly hidden by the skuttle.

Every automobile show brings out one or more cars that have unexpected features, and the Garden show will be no exception to the rule. For example, there will be shown the Oakland "Sociable," in which the single seat is sufficiently wide to comfortably accommodate three persons, and so skillfully has the design been worked out that there is no appearance of awkwardness or unusual width of the body. The Premier convertible touring car-limousine is also of particular interest because it seems to fill a place hitherto empty, inasmuch as cars of this type have been built



"CONCERT HALL" SHOWING EFFECT OF CHERRY GARDEN DECORATION

48-horsepower "six"; Palmer & Singer, who will exhibit something unusual when they stage a six-cylinder car of 40 horsepower with a wheelbase of 127 inches, the price of which is but \$2,000, with either runabout or four- or five-passenger touring body; the Stevens-Duryea company, with a new car on a "little six" chassis; the Premier company, with a touring car de luxe, which is claimed to combine many of the advantages of a limousine.

Among the mechanical features of these sixes, the new method of casting the cylinders is particularly notable, the six cylinders being cast together—"en bloc," as the French put it—affording a remarkably smooth and solid appearance. At the opposite extreme—cylinders cast separately—there are no representatives among the new-comers. As in four-cylinder motors, the majority of the "sixes" have cylinders cast in pairs, with an occasional example of

Two new Marquette models replace the former Rainier and Welch-Detroit machines, and both are on 40-horsepower chassis. A new Oldsmobile is the 26-horsepower "Defender," which is made up with four different body styles, including an inside-driven coupe. The Speedwell company's new "speedster," with 50-horsepower motor, will sell for \$2,750.

While indications of the ever increasing popularity of enclosed cars of all sorts will be seen on every hand, the inside driven coupe will lead the way in the matter of advancement, for never before were there so many cars of the sort on the market; the development of the Colonial type in particular, is one of the real developments of the year. Among the makers who will exhibit new inside driven coupes are the Cadillac, Cartecar, Haynes, Marmon, Oakland, Packard, Peerless, Regal and others. While some of these companies have ex-



only to order, while the new Premier is a stock model.

Other new cars, new fittings and new details doubtless will be disclosed when the

show is thrown open to the public, and, as usual, there will be surprises for those who think they know just what they are going to see. There are always a few makers

who prefer to hold something "up their sleeves," and these may be depended upon to add a spice of the unexpected to the last of the Garden shows.

The Cars That Will Be Displayed and Where They Will Be Located

No. 1 to 90—Main Floor and Exhibition Hall; No. 100 to 199—Elevated Platform; No. 200 to 299—Balcony.

American Locomotive Co., Providence, R. I. (103)—Alco.

American Motors Co., Indianapolis, Ind. (106)—American.

Atlas Motor Car Co., Springfield, Mass. (207)—Atlas.

Brush Runabout Co., Detroit, Mich. (112)—Brush.

Buick Motor Co., Flint, Mich. (14)—Buick.

Cadillac Motor Car Co., Detroit, Mich. (16)—Cadillac.

Cartercar Co., Pontiac, Mich. (55)—Cartercar.

Case, J. I. Co., Racine, Wis. (54)—Case.

Chalmers Motor Co., Detroit, Mich. (21)—Chalmers.

Columbia Motor Car Co., Hartford, Conn. (110)—Columbia.

Corbin Motor Vehicle Corp., New Britain, Conn. (117)—Corbin.

Dayton Motor Car Co., Dayton, Ohio (3)—Stoddard-Dayton.

E-M-F Co., Detroit, Mich. (23)—E-M-F.

Elmore Manufacturing Co., Clyde, Ohio (105)—Elmore.

Franklin, H. H., Manufacturing Co., Syracuse, N. Y. (8)—Franklin.

Garford Co., The, Elyria, Ohio (201)—Garford.

Haynes Automobile Co., Kokomo, Ind. (114)—Haynes.

Hudson Motor Car Co., Detroit, Mich. (20)—Hudson.

Inter-State Automobile Co., Muncie, Ind. (50)—Inter-State.

Jackson Automobile Co., Jackson, Mich. (111)—Jackson.

Knox Automobile Co., Springfield, Mass. (121)—Knox.

Locomobile Co. of America, Bridgeport, Conn. (10)—Locomobile.

Lozier Motor Co., Detroit, Mich. (7)—Lozier.

McIntyre Co., W. T., Auburn, Ind. (208)—McIntyre.

Marquette Motor Co., Saginaw, Mich. (204)—Marquette.

Matheson Automobile Co., Wilkes-Barre, Pa. (120)—Matheson.

Maxwell-Briscoe Motor Co., Tarrytown, N. Y. (18)—Maxwell.

Mercer Automobile Co., Trenton, N. J. (52)—Mercer.

Metzger Motor Car Co., Detroit, Mich. (104)—Everitt.

Mitchell-Lewis Motor Co., Racine, Wis. (12)—Mitchell.

Moline Automobile Co., East Moline, Ill. (107)—Moline.

Moon Motor Car Co., St. Louis, Mo. (118)—Moon.

National Motor Vehicle Co., Indianapolis, Ind. (119)—National.

Nordyke & Marmon Co., Indianapolis, Ind. (101)—Marmon.

Oakland Motor Car Co., Pontiac, Mich. (4)—Oakland.

Ohio Motor Car Co., Cincinnati, Ohio (202)—Ohio.

Olds Motor Works, Lansing, Mich. (1)—Oldsmobile.

Packard Motor Car Co., Detroit, Mich. (17)—Packard.

Palmer & Singer Mfg. Co., Long Island City, N. Y. (205)—Palmer-Singer.

Peerless Motor Car Co., Cleveland, Ohio (11)—Peerless.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (19)—Pierce-Arrow.

Pope Manufacturing Co., The, Hartford, Conn. (5)—Pope-Hartford.

Premier Motor Mfg. Co., Indianapolis, Ind. (108)—Premier.

Pullman Motor Car Co., York, Pa. (116)—Pullman.

Reo Motor Car Co., Lansing, Mich. (22)—Reo.

Selden Motor Vehicle Co., Rochester, N. Y. (109)—Selden.

S. G. V. Co., Reading, Pa. (209)—S. G. V.

Simplex Automobile Co., New York City (53)—Simplex.

Simplex Motor Car Co., Mishawaka, Ind. (51)—Simplex.

Speedwell Motor Car Co., Dayton, Ohio (203)—Speedwell.

Stearns Co., F. B., Cleveland, Ohio (6)—Stearns.

Stevens-Duryea Co., Chicopee Falls, Mass. (13)—Stevens-Duryea.

Thomas, E. R., Motor Car Co., Buffalo, N. Y. (102)—Thomas.

White Co., The, Cleveland, Ohio (2)—White.

Willys-Overland Co., Toledo, Ohio (15)—Overland.

Winton Motor Carriage Co., Cleveland, Ohio (9)—Winton.

Electric Cars.

Anderson Electric Car Co., Detroit, Mich. (214)—Detroit.

Baker Motor Vehicle Co., Cleveland, Ohio (213)—Baker.

Flanders Manufacturing Co., Pontiac, Mich. (212)—Flanders.

Waverley Co., The, Indianapolis, Ind. (104A)—Waverley.

Motorcycles.

American Motor Co., Brockton, Mass. (718)—M. M.

Aurora Automatic Machinery Co., Chicago, Ill. (708)—Thor.

Bicycling World Co., New York City (701)—The Bicycling World and Motorcycle Review.

Consolidated Mfg. Co., Toledo, Ohio (704)—Yale.

Eclipse Machine Co., Elmira, N. Y. (712)—Eclipse brakes.

Emblem Mfg. Co., Angola, N. Y. (713)—Emblem.

Excelsior Supply Co., Chicago, Ill. (707)—Excelsior.

Flanders Mfg. Co., Pontiac, Mich. (717)—Flanders.

Harley-Davidson Motor Co., Milwaukee, Wis. (716)—Harley-Davidson.

The Hendee Mfg. Co., Springfield, Ill. (703)—Indian.

Henderson Motorcycle Co., Detroit, Mich. (709)—Detroit.

Miami Cycle & Mfg. Co., Middletown, Ohio (715)—Merkel.

Motorcycling, Chicago, Ill. (706)—Publications.

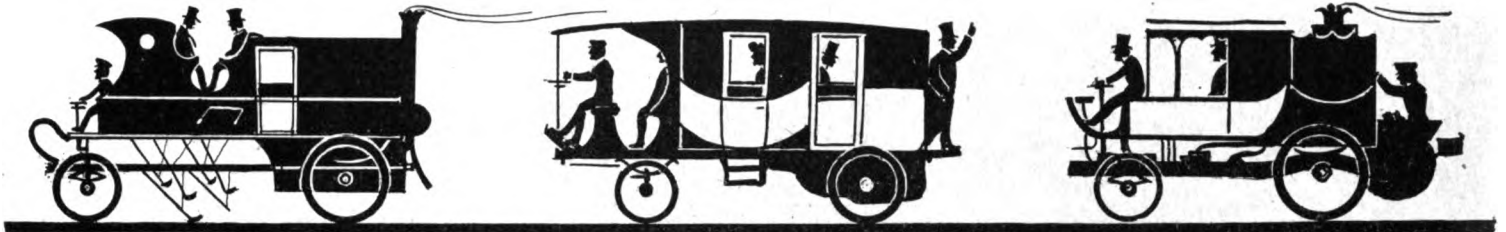
Motorcycle Publishing Co., New York City (711)—Publications.

New Era Auto Cycle Co., Dayton, Ohio (714)—New Era.

The Pierce Cycle Co., Buffalo, N. Y. (705)—Pierce.

The Pope Mfg. Co., Hartford, Conn. (719)—Pope.

Reading Standard Co., Reading, Pa. (710)—Reading Standard.



The Newness That Will Sharpen Interest in the Display of Accessories

Of the wealth of accessories that will be exhibited in the Garden, the rush and nature of recent events will bring engine-starters into the bold foreground. While last year only two self-starters were displayed—both spring-operated devices—no less than nine such inventions are included in this year's show list, and from present appearances there is no telling how many more will crop out in unexpected places. Jumping into a big lead, the Ignition Starter Co., of Detroit, Mich., comes into the show with the endorsement of several of the leading manufacturers, who have adopted its product, the Disco starter, as regular equipment on their 1912 models. The Disco uses acetylene gas for the purpose of giving the first impulse to the motor, which system also is followed in the Meteor self-starter, fathered by the Meteor Auto Tank Co. Compressed air is the "prime mover" in the combined motor starter and tire inflater shown by the Janney-Steinmetz Co., of Philadelphia, Pa., for the first time, while mere spring power starts the motor equipped with the Gardner engine starter, produced by the Gardner Engine Starter Co., of Chicago, Ill. Electricity is utilized by the Apple Electric Co.'s Aplco system; the Dayton Engineering and Laboratories Co.'s Delco, the Dean Electric Co.'s Dynalux, and the Detroit Electric Appliances Co.'s system, all of which are installed with a combined lighting and ignition outfit.

Combined lighting and ignition systems, unconnected with self-starting devices, will be shown for the first time by C. F. Splitdorf, Inc., New York City (Splitdorflite); the Remy Electric Co., Anderson, Ind., which latter company also will disclose a new magneto and a new product, called Bakelite, for use in the distributor parts; while a new electric lighting system will be shown on the stand of Gray & Davis, Amesbury, Mass. The famous Bosch magneto will be displayed in improved form and weatherproof form. Another new magneto called "No-Lag," will be seen at the stand of the American Circular Loom Co., Aldene, N. J., while a vibrator coil of unusual construction forms the piece de resistance of the Kokomo Electric Co., Kokomo, Ind. Spark plugs of unique form will be exhibited by the V-Ray Sales Co., Syracuse, N. Y., the Connecticut Telephone & Electric Co. (Plug Coil), the Champion Ignition Co., Flint, Mich., (AC Waterproof), the Jeffery-

Dewitt Co., Detroit, Mich., and A. R. Mosler & Co., New York City. The latter firm is bringing out also a novelty in anti-skidding devices, called the "Skidnit," which consists of a tripod arm fixed to the rear axle and a flat surface carried on rollers.

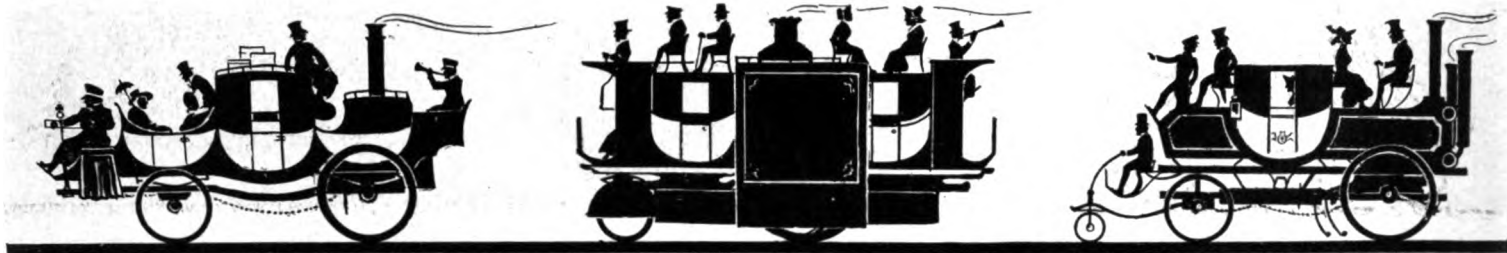
Anti-skidding devices built into the tires or attached to them naturally form an important part of the exhibit of the tire and rim companies. The most radical departure in the line of anti-skid treads of rubber will be uncovered by the Diamond Rubber Co., Akron, Ohio, it consisting of cross bars and lengthwise bars designed to give a "squeegee" effect by pushing away the mud and leaving a dry pavement for the succeeding bars to get a grip on. The B. F. Goodrich Co., too, will show a non-skid tire of unusual construction, the same utilizing three chains of heavy disks running circumferentially around the tire. This tire is marketed under the trade name "Shur-Grip." Following the success of the "Staggard Tread" idea in pneumatic tires, the Republic Rubber Co., Youngstown, Ohio, is bringing out a "Staggard Tread" solid tire for electric vehicles, built on the line of the patented staggered tread of the pneumatic. A non-skid tire of more conservative design is shown by the Goodyear Tire & Rubber Co., Akron, Ohio, in the form of diamond-shaped blocks added to the regular thickness of the tread, while the New Jersey Car Spring & Rubber Co., Jersey City, shows a new anti-skid tire of irregular block design. Other non-skid tires, which are exhibited but which are not exactly new, are the "Nobby Tread" tires of the United States Tire Co., and the "raised letter tread" of the Firestone Tire & Rubber Co., Akron, Ohio. Anti-skidding devices not built into the tire will find their most distinguished representative in the Weed chain tire grip shown in various forms by the Weed Chain Tire Grip Co., New York City, while Woodworth treads, as heretofore, will form the mainstay of the exhibit of the Leather Tire Goods Co., Niagara Falls, N. Y.

While no radical innovations in the line of speed recording devices are to be shown, several of the well-known speedometer makers will exhibit instruments showing improvements to a marked degree. The Stewart & Clark Mfg. Co., for instance, will present its new style of combination speedometer-odometer in which the drive is direct, with the figures mounted on celluloid

cylinders affixed to bronze gears. It is fitted with a drop forged swivel joint, a swivel block and new type of steering arm clamp adaptable to nearly all cars. The clocks used in combination with the speedometer also have been improved, and can now be set by means of the rim. By pulling out the rim and pulling it the hands will move to any position required. Added to these improvements the company announces a reduction of 60 per cent. in the price of all parts for the instrument. A new swivel model will be seen on the stand of the Hoffecker Co., Boston Mass., while other models will be fitted with a new reset counter. The same improvement forms a feature of the instruments to be shown by the Veeder Mfg. Co., and the Warner Instrument Co., which otherwise are practically identical with the offerings of last year. A hub odometer of standard design for use on motor trucks, and a gasoline meter constructed without pulleys, floats or strings, form the novelties to be seen on the stand of the Jones Speedometer, where. It is needless to add, a full line of speedometers, odometers, recorders and other indicating instruments will be on view.

In contrast to the flood of whistles, exhaust horns, electric horns, and all manner of other "noise producers" which made their appearance at the last few shows, there will be only one newcomer, the Sonora electric horn, made by the Sonora Motor Horn Co., New York City. Improvements and changes, however, have been made in the Tuto horn, to which has been added a smaller edition (the Tutoette) by its makers, the Dean Electric Co., Elyria, Ohio, and in the Newton electric horn, made by the Automobile Supply Mfg. Co., Brooklyn, N. Y., which has been supplied with an entirely new style of driving motor. To the well-known line of Klaxon and Klaxonet horns there has been added the Combination Klaxonet bulb-horn, no other improvements or changes having been considered necessary by the maker, the Lovell-McConnell Mfg. Co., Newark, N. J. A hand operated horn of the ratchet type, fitted with a spring, will be shown on the stand of the G. Piel Co., Long Island City, N. Y., under the style the Long Horn.

In the line of shock absorbers the Mondex represents the newest development. It will be shown by the Aristos Co., New York City, along with a lamp-lighting de-



vice, the Mondex muffler, Disco starter and other patented devices, for which the company is the selling agent. J. A. Sager, who specializes in bumpers and springs, this year will show also a lamp lighting system called the Spark-O-Lite.

There is a dearth of novelties in the line of transmission chains, the only new offering announced being that of the Whitney "silent" chain, made by the Whitney Mfg. Co., Hartford, Conn., the other old-established companies showing their standard forms of chains for driving purposes with only minor improvements.

While, of course, the majority of the slide valve motors to be exhibited in the show will be found on the cars themselves, there will be at least two accessory makers who will exhibit this latest style of internal combustion motor. They are the

Sphinx Motor Co., of New York, and the Mead Engine Co., of Chicago, Ill., the former announcing its slide valve motor, while the latter will present a rotary valve engine of unusual construction. Both, however, are not new to the trade itself, being rather well known, in fact.

Carburettors appear to have reached a state of comparative lethargy—or the makers are satisfied with their output—for only one new style is expected to make its appearance at the show, this being a product of Byrne, Kingston & Co., Kokomo, Ind. Slight changes and improvements are certain to be found in some of the other well-known makes, such as the Stromberg, Wheeler & Schebler, Excelsior, Rayfield, etc. The Stromberg double-jet carburetter has been brought to a stage where it now is styled the "six-cylinder

carburetter," which carries its own valuable suggestion.

The already long and complete line of Solar lamps still further has been enlarged by the addition of no less than seventeen new styles, while the Edmunds & Jones Mfg. Co., Detroit, Mich., likewise will display several additions to its well-known line. In both instances the new lamps include both gas and electric types.

Besides these more important novelties and striking improvements there naturally will be a host of minor novelties in the line of vulcanizing outfits, tire accessories, tool boxes, top materials, windshields and bulb horns—enough to almost befog the brain of the average visitor, and to discomfit the statistician desirous of keeping track of the new things exhibited at the Twelfth Annual Automobile Show.

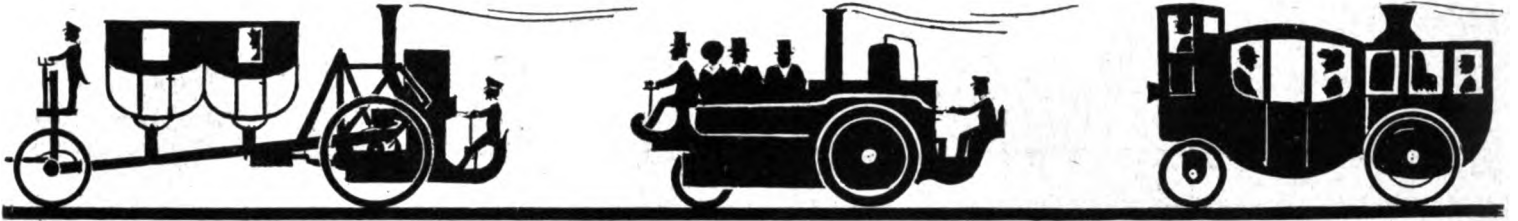
The 322 Exhibits of Accessories That Will Be Displayed

122-190, Elev. Platform; 216-292, 2d Balcony; 301-321, Concert Hall; 402-430, 2d Tier Boxes and Room 7; 500-626, Basement.

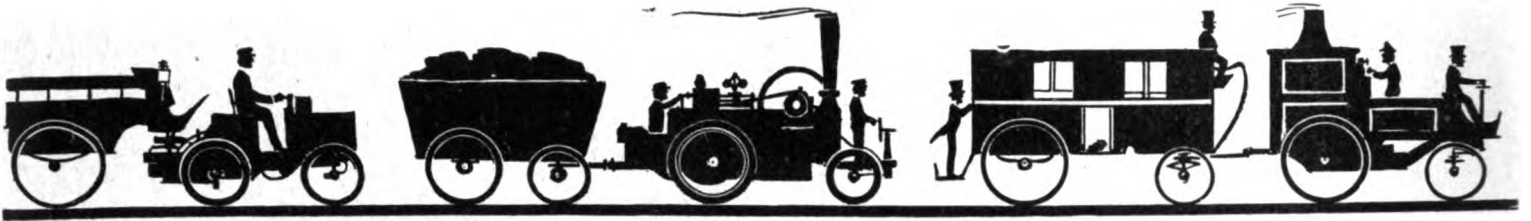
Ajax-Grieb Rubber Co., New York City (157)—Ajax tires.
 Ajax Trunk and Sample Case Co., New York City (603)—Tire trunks.
 Alexander Mfg. Co. J., New York City (526)—Specialties.
 Allen Auto Specialty Co., New York City (314)—Tire covers, tire gauges, tire locks and holders.
 American Ball Bearing Co., Cleveland, Ohio (178)—American ball bearings and axles.
 American Bronze Co., Berwyn, Pa. (503)—Bronze castings.
 American Circular Loom Co., Aldene, N. J., (258)—No-Lag Magnetos.
 American Oil Pump and Tank Co., Dayton, Ohio (506)—Lubricating devices.
 American Rim Co., New York City (519)—Lambert demountable rims.
 American Taximeter Co., New York City (423)—Taximeters.
 American Vanadium Co., Pittsburgh, Pa. (541)—Vanadium steel castings.
 The Anglada Co., New York City (580)—Anglada demountable rims.
 Aristo Co., New York City (502)—Mondex shock absorber; Disco self-starter.
 Ashley, James R. & Co., New York City (551)—Portable garages.
 Atlas Chain Co., Brooklyn, N. Y. (566)—Non-skid tire chains.
 Atwater Kent Mfg. Works, Philadelphia, Pa. (140)—Uni-Sparker and ignition apparatus.

Auburn Auto Pump Co., Auburn, N. Y. (281)—Tire pumps and pneumatic jacks.
 Automobile Journal Pub. Co., Pawtucket, R. I. (594)—Publications.
 Auto Specialty Co., Toledo, Ohio (422)—Specialties.
 Automobile Supply Mfg. Co., Brooklyn, N. Y. (245)—Steel lined tubing.
 Auto Wind•Shield Co., Cambridge, Mass. (573)—Windshields.
 A-Z Co., The, New York City (595)—Radiators, hoods, mudguards, metal hampers.
 Badger Brass Mfg. Co., Kenosha, Wis. (125)—Solar lamps and generators.
 Baldwin Chain and Mfg. Co., Worcester, Mass. (136)—Baldwin chains, and recoil checks and Brown steering gears.
 Bantam Anti-Friction Co., Bantam, Conn. (586)—Hangers, bearings and road guides.
 Barker, C. B. & Co., Ltd., New York City (555)—Carburettors and spark plugs.
 Barthel, Daly & Miller, New York City (587)—Schafer ball bearings.
 Batavia Rubber Co., Batavia, N. Y. (309)—Batavia solid tires.
 Baum's Castorine Co., Rome, N. Y. (577)—Lubricants, polishes.
 Benford Mfg. Co., Mt. Vernon, N. Y. (249)—Spark plugs and timers.
 Best Ignition Equipment Co., New York City (402)—Best spark plugs.
 Blackledge Mfg. Co., John W., Chicago, Ill. (533)—Auxiliary springs.

Booth Demountable Rim Co., Cleveland, Ohio (292)—Booth demountable rims.
 Bosch Magneto Co., New York City (218)—Bosch magnetos and spark plugs.
 Bower Roller Bearing Co., Detroit, Mich. (253)—Bower roller bearings.
 Bowser & Co., S. F., Inc., Fort Wayne, Ind. (190)—Bowser gasoline and oil storage apparatus.
 Briggs & Stratton Co., Milwaukee, Wis. (261)—B. & S. igniter and magnetos.
 Briscoe Mfg. Co., Detroit, Mich. (186)—Radiators and fittings.
 Brown Co., Syracuse, N. Y. (611)—Brown tire pressure testers, pumps, lamp lighters, tire tools.
 Brown-Lipe Gear Co., Syracuse, N. Y. (169)—Transmissions, differentials and steering gears.
 Buda Co., Harvey, Ill. (255)—Motors, gears, forgings, jacks.
 Byrne, Kingston & Co., Kokomo, Ind. (174)—Kingston carburettors.
 Calmton Asbestos & Rubber Works, New York (607)—Packing.
 Carnegie Steel Co., Pittsburgh, Pa. (544)—Axles, gears, springs.
 Carr Co., F. S., Boston, Mass. (531)—Automobile coverings.
 Champion Ignition Co., Flint, Mich. (244)—Coils, timers, spark plugs.
 Chandler Co., Springfield, Mass. (184)—Nameplates and monograms.
 Chicago Telephone Co., Elkhart, Ind. (241)



- Chilton Co., Philadelphia, Pa. (600)—Publications.
- Class Journal Co., New York City (545-546)—Publications.
- Clucker & Hickson Co., New York City (605)—Accessories.
- C. M. B. Wrench Co., Syracuse, N. Y. (562)—Silver King socket wrenches.
- Coes Wrench Co., Worcester, Mass. (155)—Wrenches.
- Columbia Lubricants Co., New York City (217)—Monogram oils and greases.
- Columbia Nut & Bolt Co., Bridgeport, Conn. (217)—Lock nuts and bolts.
- Connecticut Telephone & Electric Co., Meriden, Conn. (154)—Connecticut shock absorbers, spark coils, switches, and ignition specialties.
- Consolidated Rubber Tire Co., New York City (152)—Kelly-Springfield tires.
- Continental Rubber Works, Erie, Pa. (277)—Tires.
- Cook's Sons, Adam, New York City (266)—Lubricants.
- Covert Motor Vehicle Co., Lockport, N. Y. (220)—Change gear mechanisms.
- Cowles & Co., C., New Haven, Conn. (265)—Forgings, mountings, trimmings.
- Cox Brass Mfg. Co., Albany, N. Y. (510)—Brass automobile accessories.
- Cramp & Sons Ship and F. B. Co., Wm., Philadelphia, Pa. (187)—Bronze and bearing metals.
- Cross & Co., C. J., New York City (592)—Dayton airless tires.
- Crucible Steel Co., of America, Pittsburgh, Pa. (240)—Crucible steel castings.
- Daniels, Smalley, Boston, Mass. (569)—Accessories.
- Dayton Engineering Laboratories Co., Dayton, Ohio (516)—Delco ignition apparatus, lighting and starting dynamos.
- Dean Electric Co., Elyria, Ohio (243)—Tuto horns and Dynalux lighting system.
- Detroit Electric Appliance Co., Detroit, Mich. (313A)—Electric lighting apparatus and self-starters.
- Detroit Lubricator Co., Detroit, Mich. (250)—Detroit lubricators.
- Diamond Chain & Mfg. Co., Indianapolis, Ind. (138)—Chains and sprockets.
- Diamond Rubber Co., Akron, Ohio (127)—Diamond tires.
- Dixon Crucible Co., Joseph, Jersey City, N. J. (182)—Graphite lubricants.
- Doehler Die Casting Co., Brooklyn, N. Y. (310)—Die cast parts.
- Donnelly Motor Equipment Co., New York City (608)—Supplies.
- Dorian Remountable Rim Co., New York City (233)—Dorian remountable rims.
- Dover Stamping & Mfg. Co., Cambridge, Mass. (287)—Drip pans and funnels.
- Double-Fabric Tire Co., Auburn, Ind. (317)—Tires, inner tubes and patches.
- Driggs-Seabury Ordnance Corp., Sharon, Pa. (260)—Frames, crank shafts, etc.
- Duplex Magneto & Spark Plug Co., Brooklyn, N. Y. (404)—Duplex Magnetos and spark plugs.
- Dykes Co., John L. G., Chicago, Ill. (606)—Tire protectors.
- Eagle Co., Newark, N. J. (248)—Windshields and spark plugs.
- Eavenson & Sons, Inc., J., Camden, N. J. (602)—
- Edison Storage Battery Co., West Orange, N. J. (237)—Storage batteries.
- Edmunds & Jones Mfg. Co., Detroit, Mich. (181)—Lamps.
- Eisemann Magneto Co., New York City (216)—Eisemann magnetos.
- El Arco Radiator Co., New York City (578)—Radiators.
- Electric Storage Battery Co., Philadelphia, Pa. (183)—Storage batteries.
- Elliott, H. A., Detroit, Mich. (576)—Specialties.
- Endurance Tire & Rubber Co., New York City (413)—Tires and inner tubes.
- English & Mersick Co., New Haven, Conn. (159)—Metal trimmings.
- Essex Rubber Co., Inc., Trenton, N. J. (518)—Bumpers, patches, and re-liners.
- Esterline Co., Lafayette, Ind. (304)—Matchless electric lighting and ignition system.
- E. Z. Way Motor Grease Co., New York City (417)—Oils and greases.
- Fedders Mfg. Co., Buffalo, N. Y. (515)—Radiators and tanks.
- Federal Rubber Mfg. Co., Milwaukee, Wis. (222)—Federal tires.
- Findeisen & Kropf Mfg. Co., Chicago, Ill. (559)—Rayfield carbureters.
- Firestone Tire & Rubber Co., Akron, Ohio (164)—Firestone tires and rims.
- Fisk Rubber Co., Chicopee Falls, Mass. (122)—Fisk tires and rims.
- Flechter & Co., L. V., New York City (406)—"Locomotive" carbureters.
- Flentje, Ernst, Cambridge, Mass. (609)—Hydraulic recoil preventer.
- Franklin Mfg. Co., H. H., Syracuse, N. Y. (589)—Dies and castings.
- Frasse & Co., Peter A., New York City (540)—Tubing and tools.
- Gabriel Horn Mfg. Co., Cleveland, Ohio (274)—Gabriel exhaust horns and rebound snubbers.
- Garage Equipment Mfg. Co., Milwaukee, Wis. (604)—Gem spark plug wrench and supplies.
- Gardner Engine Starter Co., Chicago, Ill. (529)—Gardner engine starter.
- Geiszler Bros. Storage Battery Co., New York City (612)—Storage batteries.
- Gemmer Mfg. Co., Detroit, Mich. (307)—Steering gears and parts.
- General Electric Co., Schenectady, N. Y. (320)—Cloth pinions.
- Gibney & Bro., James L., Philadelphia, Pa. (501)—Gibney solid tires and electric vulcanizers.
- Gilbert Mfg. Co., New Haven, Conn. (273)—Tire covers, magneto covers, leggings, etc.
- Gilmer, M. S., New York City (561)—
- Globe Machine & Stamping Co., Cleveland, Ohio (271)—Steel boxes for tools.
- Goodrich Co., B. F., Akron, Ohio (126)—Goodrich tires.
- Goodyear Tire & Rubber Co., Akron, Ohio (130)—Goodyear tires.
- Gould Storage Battery Co., New York City (427)—Storage batteries.
- Gray & Davis, Amesbury, Mass. (524)—Lamps and lighting dynamos.
- Gray-Hawley Mfg. Co., Detroit, Mich. (267)—Exhaust horns and mufflers.
- Gray Specialty Co., Newark, N. J. (524)—Specialties.
- Grossman Co., Emil, New York City (626)—Red Head spark plugs.
- Hall-Thompson Co., Hartford, Conn. (564)
- Hardman Tire & Rubber Co., New York City (525)—Tires.
- Hardy & Co., F. A., New York City (528)—Autoglass goggles.
- Hardy Co., R. E., Chicago, Ill. (134)—Star-ite spark plugs.
- Harris Oil Co., A. W., Providence, R. I. (162)—Lubricants.
- Harrison Radiator Co., Lockport, N. Y. (220A)—Radiators.
- Hartford Machine Screw Co., Hartford, Conn. (160)—Spark plugs and screw machine parts.
- Hartford Suspension Co., Jersey City, N. J. (156)—Truffault-Hartford shock absorbers and jacks.
- Havoline Oil Co., New York City (232)—Lubricants.
- Haws, George A., New York City (282)—Lubricants.
- Hawthorne Mfg. Co., Bridgeport, Conn. (579)—Rotary hand air pump.
- Heinze Electric Co., Lowell, Mass. (270)—Magnetos, coils, and ignition devices.
- Herz & Co., New York City (259)—Magnetos and ignition devices.



- Hess-Bright Mfg. Co., Philadelphia, Pa. (305)—H. B. ball bearings and ball bearing grease.
- Hess Spring & Axle Co., Cincinnati, Ohio (302)—Hess axles and springs.
- Hodgman Rubber Co., New York City (262)—Rubber wearing apparel.
- Hoffecker Co., Boston, Mass. (189)—Speedometers and odometers.
- Hoffnung & Co., S., New York City (588)—Coventry chains and "Fastnut" lock washers.
- Hollingshead Co., R. M., Camden, N. J. (622)—Whiz automobile specialties.
- Homo Co., of America, Philadelphia, Pa. (601)—Homo mixer.
- Horseless Age Co., New York City (597)—Publications.
- Houpert, H. J., New York City (418)—Gears and sprockets.
- Hyatt Roller Bearing Co., Newark, N. J. (131)—Hyatt roller bearings.
- Hydraulic Oil Storage Co., Detroit, Mich. (509)—Oil tanks and storage systems.
- Ideal Wind Shield Co., New York City (575)—Windshields and tops.
- Ignition Starter Co., Detroit, Mich. (549)—Disco engine starter.
- Imperial Bearing Co., Detroit, Mich. (558)—Bearings.
- International Acheson Graphite Co., Niagara Falls, N. Y. (257)—Oildag and Gredag lubricants.
- International Metal Polish, Indianapolis, Ind. (513)—Blue Ribbon polish.
- Jackson Church Wilcox Co., Saginaw, Mich. (318)—Parts.
- Jacobson Brandow Co., Pittsfield, Mass. (252)—Magnetos and ignition specialties.
- Janney, Steinmetz & Co., Philadelphia, Pa. (173)—Engine starters and seamless steel tanks.
- Jeffrey-Dewitt Co., Detroit, Mich. (567)—Reliance spark plug.
- J. M. Shock Absorber Co., Philadelphia, Pa. (547)—J. M. shock absorbers.
- Johnson & Co., Isaac G., Spuyten Duyvil, N. Y. (284)—Forgings and castings.
- Jones & Co., Phineas, Newark, N. J. (137)—Wood wheels.
- Jones Speedometer Co., New York City (143)—Speedometers, odometers, annunciators and specialties.
- Kellogg Mfg. Co., Rochester, N. Y. (291)—Kellogg hand and power air pumps.
- Kells Mfg. Co., W. J., New York City (564)—Radiators and tanks.
- Keystone Lubricating Co., Philadelphia, Pa. (598)—Keystone oils and grease.
- K.-W. Ignition Co., Cleveland, Ohio (613)—Ignition devices.
- Laidlaw, Wm. R., Jr., New York City (428)—Waterproof fabrics.
- Leather Tire Gods Co., Niagara Falls, N. Y. (231)—Woodworth tire treads.
- Lee Tire & Rubber Co., Conshohocken, Pa. (225)—Jelco-Atlas puncture proof inner case.
- Lefever Arms Co., Syracuse, N. Y. (590)—Specialties.
- Light Mfg. & Foundry Co., Pottstown, Pa. (133)—Aluminum parts and castings.
- Link Belt Co., Indianapolis, Ind. (229)—Chains.
- Lovell-McConnell Mfg. Co., Newark N. J. (226)—Klaxon horns, bumpers and Raiswell jacks.
- McCord Mfg. Co., Detroit, Mich. (151)—Radiators, lubricators, fans and gaskets.
- McCue Co., Buffalo, N. Y. (280)—Axles.
- McGinnis, F. T., New York City (552)—Manufacturers Foundry Co., Waterbury, Conn. (276)—Castings.
- Marburg Bros., Inc., New York City (537)—Mea magnetos.
- Mead Engine Co., Dayton, Ohio (553)—Rotary valve motors.
- Merchant & Evans & Co., Philadelphia, Pa. (548)—Hele-Shaw Universal clutch, Star tire jackets, etc.
- Metal Stamping Co., Long Island City, N. Y. (421)—Stampings.
- Meteor Auto Tank Co., New York City (520)—Meteor acetylene tanks.
- Mezger, C. A., Inc., New York City (135)—Windshields and "Soot-proof" plugs.
- Michelin Tire Co., Milltown, N. J. (228)—Michelin tires.
- Miller, Charles E., New York City (161)—Supplies.
- Miller's Sons, William P., Long Island City, N. Y. (618)—Excelsior fibrous oils.
- Modern Auto Appliance Co., Chatham, N. Y. (562)—Anti-Skid chains.
- Morrison-Ricker Mfg. Co., Grinnell, Iowa (565)—Grinnell gloves.
- Mosler & Co., A. R., New York City (180)—Spitfire spark plugs.
- Mossberg Co., Frank, Attleboro, Mass. (581)—Mossberg wrenches and bells.
- Motor, New York City (556)—Publications.
- Motor Car Equipment Co., New York City (617)—Supplies.
- Motor Vehicle Publishing Co., New York City (560)—Publications.
- Motor World Publishing Co., New York City (505)—The Motor World.
- Motz Clincher Tire & Rubber Co., Akron, Ohio (234)—Motz cushion tires.
- Muncie Gear Works, Muncie, Ind. (239)—Wheels, gears, etc.
- Mutty Co., L. J., Boston, Mass. (615)—Automobile top fabrics.
- Mutual Auto Accessories Co., New York City (598 A)—Supplies.
- Narragansett Chemical Co., Providence, R. I. (411)—Meteor oils, greases and polishes, and storage batteries.
- Nash Co., George, New York City (415)—Iron, steel and seamless tubing.
- Nathan Novelty Mfg. Co., New York City (621)—Leggins, bags and waterproof specialties.
- National Carbon Co., Cleveland, Ohio (132)—Dry cells.
- National Coil Co., Lansing, Mich. (263)—Spark coils.
- National Rubber Co., St. Louis, Mo. (242)—Rubber preservatives.
- National Tube Co., Pittsburgh, Pa. (139)—Shelby seamless steel tubing.
- New Departure Mfg. Co., Bristol, Conn. (223)—Ball bearings.
- New Jersey Car Springs & Rubber Co., Jersey City, N. J. (425)—Tires and inner tubes.
- Newmastic Tire Co., New York City (539)—Tire filling compound.
- New Miller Mfg. Co., Los Angeles, Cal. (591)—New Miller carburetter.
- New York Coil Co., New York City (624)—Ignition apparatus.
- New York & New Jersey Lub. Co., New York City (141)—Columbia lubricants.
- New York Sporting Goods Co., New York City (251)—Supplies.
- New York V-Ray Sales Co., Syracuse, N. Y. (561)—V-Ray spark plugs.
- Niagara Lead & Battery Co., Niagara Falls, N. Y. (585)—Storage batteries.
- Noera Mfg. Co., Waterbury, Conn. (278)—Pumps and oil cans.
- Noonan Tool & Mach. Works, A. S., Rome, N. Y. (514)—Noonan tools and specialties.
- North East Electric Co., Rochester, N. Y. (517)—Ignition apparatus.
- Northway Motor & Mfg. Co., Detroit, Mich. (319)—Motors.
- Oliver Mfg. Co., Chicago, Ill. (172)—Peerless jacks.
- Pantasote Co., New York City (221)—Tops and upholstering materials.
- Paragon Auto Parts Mfg. Co., New York City (416)—Sheet metal parts.
- Pennsylvania Rubber Co., Jeannette, Pa. (147)—Pennsylvania and Polack tires.
- Perfection Spring Co., Cleveland, Ohio (542)—Perfection Automobile springs.



- Perfect Window Regulator Co., New York City (403)—Window regulating devices.
- Philadelphia Storage Battery Co., Philadelphia, Pa. (565)—Storage batteries.
- Piel Co., G., Long Island City, N. Y. (316)—Horns and muffler cut-outs.
- Pittsfield Spark Coil Co., Dalton, Mass. (167)—Magnetos, coils and plugs, and ignition devices.
- Polson Mfg. Co., Buffalo, N. Y. (568)—Steel.
- Power Wagon Publishing Co., Chicago, Ill. (556)—Publications.
- Prince Tire Co., New York City (570)—Tires and tubes.
- Prosser & Son, Thomas, New York City (599)—Steels.
- Remy Electric Co., Anderson, Ind. (146)—Remy magnetos and lighting apparatus.
- Republic Rubber Co., Youngstown, Ohio (148)—Republic tires.
- Rhineland Machine Works Co., New York City (543)—Ball bearings.
- Rielly & Son, P., Newark, N. J. (424)—Lap robes.
- Riley-Klotz Mfg. Co., Newark, N. J. (623)—Bulb horns.
- R. I. V. Co., New York City (615)—R. I. V. ball bearings.
- Rose Mfg. Co., Philadelphia, Pa. (279)—Neverout lamps, licenses, brackets and radiator heaters.
- Ross Gear & Tool Co., Lafayette, Ind. (314)—Steering gears.
- Royal Equipment Co., Bridgeport, Conn. (238)—Band brakes and brake lining material.
- Rushmore Dynamo Works, Plainfield, N. J. (285)—Lamps and lighting dynamos.
- Russian Tire Co., New York City (290)—Tires.
- Sager Co., J. H., Rochester, N. Y. (269)—Sager bumpers and supplementary springs.
- S. & S. Shock Absorber Co., Washington, D. C. (535)—S. & S. shock absorbers.
- S. B. R. Specialty Co., East Orange, N. J. (614)—S. B. R. muffler cutout, wire clamps, etc.
- Seamless Rubber Co., New Haven, Conn. (275)—Bragg stitched tires.
- Shaler Co., C. A., Waupum, Wis. (264)—Steam and electric vulcanizers.
- Shawmut Tire Co., Boston, Mass. (512)—Shawmut tires.
- Sheldon Axle Co., Wilkes-Barre, Pa. (534)—Axles and springs.
- Simonds Mfg. Co., Fitchburg, Mass. (557)—Tools.
- S. K. F. Ball Bearing Co., New York City (504)—S. K. F. Ball bearings.
- Smith Co., A. O., Milwaukee, Wis. (149)—Gears and parts.
- Smith, Grant E., Poughkeepsie, N. Y. (429)
- Smith Gasoline Meter Co., New York City (335 A)—Gasolene meters.
- Sonora Motor Horn Co., New York City (554)—Horns.
- Sonneborn Sons, L., Inc., New York City (521)—Oils and greases.
- Spacke Machine Co., F. W., Indianapolis, Ind. (312)—Motor cycle engines and automobile parts.
- Sparks-Withington Co., Jackson, Mich. (308)—Fans, stamping and screw machine products.
- Sphinx Motor Co., New York City (584)—Sphinx slide valve motors.
- Spicer Mfg. Co., Plainfield, N. J. (168)—Spicer universal joints.
- Splitdorf, F. C., Inc., New York City (128)—Splitdorf magnetos and plugs.
- Sprague Umbrella Co., Norwalk, Ohio (301)—Tops and windshields.
- Springfield Metal Body Co., Springfield, Mass. (224)—Metal bodies.
- Standard Roller Bearing Co., Philadelphia, Pa. (163)—Standard roller bearings.
- Standard Thermometer Co., Boston, Mass. (247)—Standard speedometers.
- Standard Tire & Rubber Co., Boston, Mass. (582)—Tires.
- Standard Tire Protector Co., Akron, Ohio (527)—Standard tire protectors.
- Standard Welding Co., Cleveland, Ohio (177)—Electrically welded tubing and parts.
- Stanley, John T., New York City (583)—Oils and greases.
- Star Speedometer Co., Milton, Pa. (405)—Star speedometers.
- Start-Lite Co., Chicago, Ill. (306)—Automatic lighting devices.
- Stearns Mfg. Co., Culver, Worcester, Mass. (571)—
- Stein Double Cushion Tire Co., Akron, Ohio (286)—Cushion tires.
- Stevens & Co., New York City (619)—Acorn pump nipple.
- Stewart & Clark Mfg. Co., Chicago, Ill. (227)—Stewart speedometers.
- Stromberg Motor Devices Co., Chicago, Ill. (235)—Stromberg carbureters.
- Stutz Auto Parts Co., Indianapolis, Ind. (254)—Parts.
- Swinehart Tire & Rubber Co., Akron, Ohio (171)—Swinehart tires.
- Texas Co., New York City (246)—Lubricants.
- Thompson Auto Co., Andrew C., Plainfield, N. J. (538)—
- Timken Detroit Axle Co., Detroit, Mich. (166)—Axles.
- Timken Roller Bearing Co., Canton, Ohio (165)—Roller bearings.
- Tingley & Co., Charles O., Rahway, N. J. (407)—Tire patches and vulcanizing outfits.
- Torbenson Gear & Axle Co., Bloomfield, N. J. (313)—Gears and axles.
- Tracy, Joseph, New York City (536)—Dynamometer and testing apparatus.
- Treadwell Engineering Co., Lebanon, Pa. (230)—Steel castings.
- Troy Carriage Sunshade Co., Troy, Ohio (508)—Windshields and tops.
- Tyron Auto Pump Co., New York City (620)—Friction driven tire pump.
- Tucker Co., Charles H., New York City (511)—Tires and inner tubes.
- Tucker Tool & Machine Co., New York City (523)—Screw plates and tools.
- Turner Brass Works, Sycamore, Ill. (158)—Brazing apparatus, tire pumps, etc.
- Typhoon Signal Co., Chicago, Ill. (414)—Typhoon automobile signal.
- Union Auto Specialties Co., Brookville, Pa. (610)—Supplies.
- United Rim Co., Akron, Ohio (315)—Standard universal rims.
- United States Auto Horn Co., New York City (532)—Bulb horns.
- United States Light & Heat Co., New York City (144)—Storage batteries.
- United States Tire Co., New York City (124)—Hartford, G. & J., Morgan & Wright, Continental and United States tires.
- United Steel Co., New York City (507)—Vanadium steel.
- Vacuum Oil Co., Rochester, N. Y. (188)—Vacuum Mobiloil.
- Valentine & Co., New York City (272)—Varnishes.
- Vanadium Metals Co., Pittsburgh, Pa. (311)—Victor vanadium bronze.
- Van Auken Indicator Co., New York City (409)—Gasolene indicators.
- Vanguard Mfg. Co., Joliet, Ill. (625)—Windshields, bumpers, stampings, castings.
- Veeder Mfg. Co., Hartford, Conn. (123)—Speedometers and odometers.
- Velox Polish Mfg. Co., New York City (412)—Velox polish.
- Vesta Accumulator Co., Chicago, Ill. (268)—Accumulators.
- Voorhees Rubber Mfg. Co., Jersey City, N. J. (303)—Inner tubes and patches.
- Ward Leonard Electric Co., Bronxville, N. Y. (574)—Lighting dynamo.
- Warner Gear Co., Muncie, Ind. (176)—Gears and parts.



Warner Instrument Co., Beloit, Wis. (150)—Warner autometers and clocks.
 Warner Mfg. Co., Toledo, Ohio (236)—Motors, transmissions and steering gears.
 Wasson Piston Ring Co., Bayonne, N. J. (430)—Wasson piston rings.
 Wayne Oil Tank & Pump Co., Fort Wayne, Ind. (550)—Wayne oil tanks.
 Weed Chain Tire Grip Co., New York City (142)—Weed tire chains.
 Westen Mfg. Co., Newark, N. J. (530)—Westen shock absorbers.

Wheeler & Schebler Co., Indianapolis, Ind. (145)—Schebler carburettors and magnetos.
 Weston-Mott Co., Flint, Mich. (170)—Rims and wheels.
 Western Tool & Forge Co., Brackenridge, Pa. (289)—Forgings and tools.
 White & Bagley Co., Worcester, Mass. (288)—Lubricants.
 Whitney Mfg. Co., Hartford, Conn. (179)—Whitney chains.
 Willard Storage Battery Co., Cleveland,

Ohio (283)—Elba storage battery lighting outfits.
 Willey Co., C. A., Long Island City, N. Y. (420)—Paints.
 Williams & Co., J. H., Brooklyn, N. Y. (175)—Forgings.
 Winn, William R., New York City (425)—Graphite and cotton waste.
 Wolverine Lubricants Co., New York City (313)—Lubricants.
 Young, Orlando W., Newark, N. J. (153)—Lubricants.

Buffalo Starts Local Show Season.

Buffalo broke the ice and opened the 1912 show season on Saturday last, December 30, when the tenth annual show of the Buffalo Automobile Board of Trade, was inaugurated in the 74th Regiment Armory. It was an improvement on its predecessors, the Armory having 22,000 square feet of floor space more than the old Broadway Arsenal, where the previous show was held, allowing a width of 22 feet for the five main aisles, which width, however, was hardly enough to permit the free passage of the immense crowds.

The ceiling and galleries are festooned with evergreens and draped with gay colored bunting, and the four corners of each show space, stands a white pillar, entwined with greens, atop of which is a shield bearing only the name of the car exhibited.

The whole center of the drill hall is devoted to the display of pleasure cars, the east and west sides being given over to the exhibition of commercial vehicles and accessories respectively. In all there are 64 exhibits, the largest of which is the Poppenburg display of 18 cars.

The following are included in the list of exhibitors: Co-operative Motor Car Co., Stevens-Duryea, Pope-Hartford and Abbott-Detroit; Ralph E. Brown Motor Co., American, Winton and Babcock Electric; Kane Motor Supply Co., Cadillac; Lewis Engel, Jr., Cartecar; J. I. Case Threshing Machine Co., Case; Mason B. Hatch, Hupmobile, Stearns and Chalmers; United Motor Buffalo Co., Maxwell and Columbia; Baker Bros. Motor Co., Cole; E. E. Denniston Co., Denniston Commercial Car; Matheson Automobile Sales Co., Matheson, DeTamble, and Union; Studebaker Corporation, E-M-F; Poppenburg Motor Car Co., Everitt, Marathon, Paige-Detroit, Warren-Detroit, Victor truck; Ford Motor Co., Ford; George Ostendorf, Franklin; The Buffalo Maintenance Co., Grabowsky;

Sanderson & Burghardt, Havers Six; Barrett Motor Car Co., Hudson; Hupp Corporation, Hupp-Yeats Electric and R. C. H.; Buffalo Kissel Kar Co., Kissel Kar; Windsor Motor Car Co., Kline Kar; Meyer Motor Car Co., Knox, Pullman and Reo; Krit Motor Car Co., Krit; Harry L'Hommédieu, Marion; Frontier Motor Car Co., McFarlan Six; John J. Gibson, Mitchell; Zimmer Motor Vehicle Co., Pathfinder and National 40; Centaur Motor Co., Oakland; Overland Buffalo Co., Overland; The Densmore Co., Packard; Henry Brun Auto Co., Peerless; Pierce-Arrow Sales Co., Pierce-Arrow; Co-Operative Motor Car Co., Pope-Hartford and Stevens-Duryea; Lutz Automobile Co., Premier and White; U. S. Auto Station, Rauch & Lang Electric; J. A. Kramer, Stoddard-Dayton; E. R. Thomas Motor Car Co., Thomas Six; Dixon Motor Car Co., Velie.

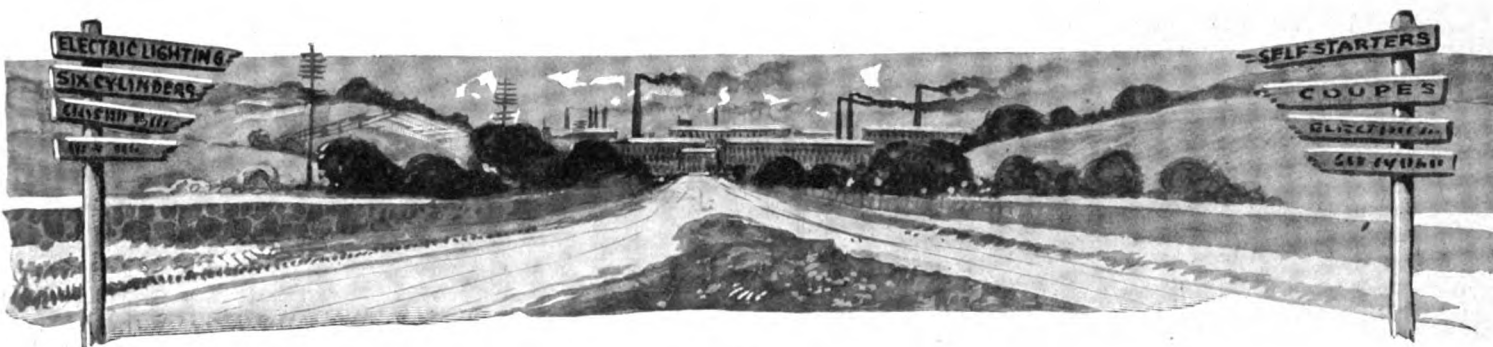
Knight Engine's Queer Turn in Canada.

Although the Russell Motor Car Co., of Toronto, has the exclusive right to manufacture and sell Knight-engined cars in Canada, it transpires that Joseph Maw & Co., of Winnipeg, have brought into the Dominion several Daimler cars equipped with Knight motors. As the exclusive Canadian license was granted to the Russell company, the situation has caused some comment but it develops that the Knight patents in Canada do not go into effect until May 1, 1912, or one year after they have been allowed by the patent office and consequently until that date the Russell company will not be in a position to fully enforce its rights in the matter. In this connection, it may not be generally known that while the American licensees under the Knight patent are prohibited from selling their cars in any other country in which Knight patents have been granted, all of the European licensees are free to ship cars to America.

Joseph E. G. Ryan Succumbs Suddenly.

Joseph E. G. Ryan, one of the best known and most talented newspapermen and writers who have become intimately connected with the automobile industry, was found dead in his room in the Congress Hotel, in Chicago, on Tuesday last, 2nd inst. As his hand was found clutching his heart, it is supposed that an attack of heart disease caused his death. He retired the night before apparently in the best of health, and it was not until Tuesday, when his failure to appear caused apprehension, that the door of his room was forced open and he was found lifeless on the floor. He had been dead for several hours. In addition to being a capable writer, Ryan also had a keen head for business and was possessed of a fund of ready wit and repartee that of late years made him much in demand as toastmaster or speaker at public functions. Indeed, he was to have been one of the speakers at the Maxwell-Glidden Trophy Banquet in New York yesterday.

Ryan controlled absolutely the automobile department of the Chicago Inter-Ocean, and under the terms of a rather unusual contract conducted it according to his own lights. He had served as press agent for both horse shows and automobile shows, but his most notable work of late years, so far as the automobile industry is concerned, was the publicity campaign which he conducted in the interests of the Knight sleeve valve matter. He also acted as publicity agent for the Mitchell Motor Car Co. and several others. He had dipped into politics also, and was in a fair way to make a name for himself in that field. His activities were varied and were such that in the course of a few years he had amassed a snug fortune. Ryan lived alone in the Chicago hotel in which he died, his wife having passed away some two years since.



Signs of the Times: the Trends of the Trade

Having by gradual stages passed through the infantile and formative stages and reached that period where there is produced practically but one broad type of pleasure car, a type soundly built on the firm foundation of experience and which, as the years pass, shows lessening variation, it is not difficult to forecast the trends and tendencies of the trade. There never was a year when it was easier to read and point out the "signs of the times." The foreshadows of the forthcoming shows are distinct and unmistakable. Categorically these foreshadows, which will be emphasized by actual and collective disclosures at the shows, are:

Automatic engine starters.

Development of the coupe.

Adoption of the closed-front as the standard type of touring car body.

Adoption of the skuttle dash as the standard type.

Increased number of popular priced cars.

Increase of six-cylinder cars without substantial decrease of "fours."

Sleeve and rotary valve engines.

Simplification of control systems.

Self-contained lubricating systems.

Cleaner running-boards and dashes.

Increased use of demountable rims.

Advance in the employment of electric lighting systems.

Unprecedented completeness of equipment.

Self starters.—If one were seeking a designation to be applied to the present year it undoubtedly would be styled "self-starter" year. Engine starters have been used in isolated cases for years, but had attracted little attention until within the last few months. Once under way, however, the starter developed with a sudden rush and came into popular favor so suddenly and unexpectedly, that it is still looked upon as a thing almost unknown, despite the fact that thousands are being manufactured and installed. Of the five general types made—acetylene, compressed air, electric, spring and gasoline—the acetylene

is far and away the most generally employed, having the great advantage of adding very little complication and of making use of the existing ignition system of the car and of the acetylene gas tank commonly carried. The compressed air system temporarily converts the motor into an air engine, and runs it for a few revolutions by straight air pressure, while in the electric type a motor is geared direct to the crankshaft, and draws its current from a storage battery which it subsequently charges by running as a dynamo driven by the engine. The electric starter is usually a part of the electric lighting system of the car, the motor-dynamo generating the current that is stored and used for lighting, as well as motor starting. The gasoline starter introduces charges of explosive vapor into the cylinders, where they are ignited by the regular ignition system, and the spring starter depends upon power stored in heavy coiled steel springs wound up by the engine when running. Only an actual inspection of the exhibits at the shows can reveal what other types have been developed. They are likely to be found in unexpected forms in unexpected places.

Development of the coupe.—Among the advances that have undoubtedly been made in the building of all-weather cars—coupes, limousines, Berlins—none stands out so prominently as the progress of the inside driven coupe for two, three or four passengers. The big luxurious Berlin, or double limousine, in which the chauffeur is enclosed as well as the passengers, has increased noticeably and the limousine has of course shared the general progress; but the utility and practicability of the coupe seem to have found appreciation as never before, whether of Colonial or "uncolonial" type, and no car is of smarter appearance.

Adoption of the closed front as the standard type of touring car body.—Since its general introduction at the shows of 1911 the closed-front or so-called "fore-door" body has become what may be

termed the standard type for touring cars and even for runabouts or two-passenger roadsters; the open front has become the rare exception. Harmonious designs, in which the forward doors are obviously part of the scheme and not afterthoughts, are the rule, and the general effect is one of smartness and, at the same time, comfort and coziness. But regard for ventilation is not as great as should be the case.

Adoption of the skuttle dash as the standard type.—Harmonizing with the closed-front type of body, the skuttle dash seems to be its logical accompaniment, and so far-reaching is its influence that it is found on cars of all classes, from the smallest runabouts to the largest Berlins; it practically has become the standard type. Again like the closed front, the skuttle dash adds to the appearance of any kind of body when skilfully worked in; it removes the abruptness of sharp corners.

Increased number of popular priced cars.—Cars for "men of moderate means" have increased and multiplied amazingly, and the variety that is available at \$1,200 or less is direct evidence that there is a large market for them. Not only have more makers entered the field, but those already established have increased their manufacturing facilities, and are turning out cars in vast numbers. One potent factor in the development of this class of vehicle is the possibility of cost reduction by quantity production, and both makers and purchasers are benefiting accordingly. It is to be remarked, however, that an appreciable number of makers who produced cars at \$1,200 or less have added a higher priced model to their lines.

Increase of six-cylinder cars without substantial decrease of "fours"—The six-cylinder car, usually looked upon as the height of luxury in motor construction, has increased numerically, but strange to say not at the expense of "fours," for while a number of makers of the latter class have added "sixes" to their products, none has wholly discarded the "four." For the most



part the six-cylinder motors are developments of their four-cylinder predecessors, and in some cases are identical with the "fours," so far as cylinders and valve mechanism are concerned. This plan of using cylinders of a type already in use has the advantage of embodying features that are of known value. The practice of casting cylinders separately for the "sixes" is confined practically to such engines as the Stoddard-Dayton Knight and the Franklin air-cooled "six," in which there are special reasons for the practice. Pair-cast cylinders are more generally employed, while there are examples of triple-cast cylinders, such as the Chalmers, and even of sixes "en bloc" as in the Fiat and Everitt.

Sleeve and rotary valve engines.—The success of the Knight sleeve valve engine has had the effect of stimulating endeavors to devise valve systems that will not only avoid the faults of the poppet valve, but will not infringe on the Knight patents. The Knight system is embodied in such well-known cars as those made by the Columbia, Stearns, Atlas and Stoddard-Dayton companies, the latter building the only six-cylinder Knight as yet turned out in this country. Other non-poppet valve systems are on the market, such, for instance, as the rotary valve in a Hudson model, to say nothing of the rotary valves employed in a number of two-stroke motors to govern the admission of vapor to the cylinders or crank-cases, as the case may be.

Simplification of control systems.—Each year has witnessed a gradual decrease in the number of levers and pedals required for the control of the car, as well as an increase in the simplicity and directness of the movements required. The present season is no exception, and the clean, clear appearance of some of the cars now built is due in large measure to this fact. The adoption of the closed-front has had a good effect in that it has made necessary the placing of levers inside the body, in many instances, and in not a few cases a central position has been adopted, the levers being manipulated with the left hand, while the right is free for steering. Steering from the left side of the car has not made the advance that once was expected. Left-hand steer and center control is a combination that has good points and is embodied in at least one make of car.

Self-contained lubricating systems.—For some years there has been an inclination on the part of manufacturers to adopt lubrication systems that are part of and entirely contained in the motor, eliminating all ex-

traneous oiling devices. This tendency seems to be increasing, and it now is rather the rule than the exception to equip motors with some type of internal oiling arrangement. The chief recommendation of such systems is that they offer very little opportunity for the accidental stoppage of the supply of oil to bearing surfaces.

Advance in the employment of electric lighting systems.—Whereas it was at one time considered that a car was "electrically lighted" if it had a small dome lamp in the ceiling, the tendency now is to electrically light all lamps—even, in two cases, to provide such a light to illuminate the step. Electric generators, storage batteries and auxiliary apparatus has kept pace with the times, and the modern automobile electric lighting plant is a splendid example of electrical engineering.

Cleaner running boards and dashes.—While the mass of apparatus that cluttered dashboards and running boards in earlier days has been cleared off to a very great extent, the tendency is toward still more of the "clearing off" process. In some cases the dashboard now is bare save for an ignition switch, and in others the toolbox and even the gas tank have been taken from the running-board and housed elsewhere. The clean appearance produced in this way is in keeping with the long straight lines of the modern body and the generally smooth, clean appearance of the car.

Increased use of demountable rims.—Like other features of equipment that have proved their real worth, the demountable rim has gained substantial ground; the trend all is in its direction. It is not yet universal equipment, but the indications are pointing that way; they are strengthened by the adoption of the rim as the standard equipment of a number of popular-priced cars.

Unprecedented completeness of equipment.—While tools, head and tail lights and gas tanks or generators have constituted the usual equipment of cars for years, and in some instances other items have been included, in the past there never was anything like the generosity that now is displayed in providing equipment. The appurtenances that go with some of the higher-priced cars include practically everything that could be asked for—top, windshield, speedometer, clock, electric lighting system, self-starter, horn and electric signal, spare tire, demountable rims, toilet case, flower glass—and one maker even goes so far as to add an electric tire vulcanizer. Even the lower-priced cars show

this tendency toward complete equipment, some of which include in the list price not merely lamps, tops, windshields, speedometers and self-starters, but even demountable rims.

Glidden Trophy Is Formally Presented.

For the first time since Charles J. Glidden offered the famous trophy bearing his name, to be contested for annually in an endurance run over American roads, the presentation of it to the winner was attended by appropriate ceremonies and a formal luncheon, accompanied by speech-making, toasting and good-natured "jolly-ing" of the donor and the winner. Benjamin Briscoe, president of the United States Motor Co., which had entered the winning team of three Maxwell cars, valiantly stood up in the glare of the flashlight, surrounded by the drivers of the cars, and Donor Glidden clasped his hand while some seventy-five members of the trade and press applauded the action to the echo.

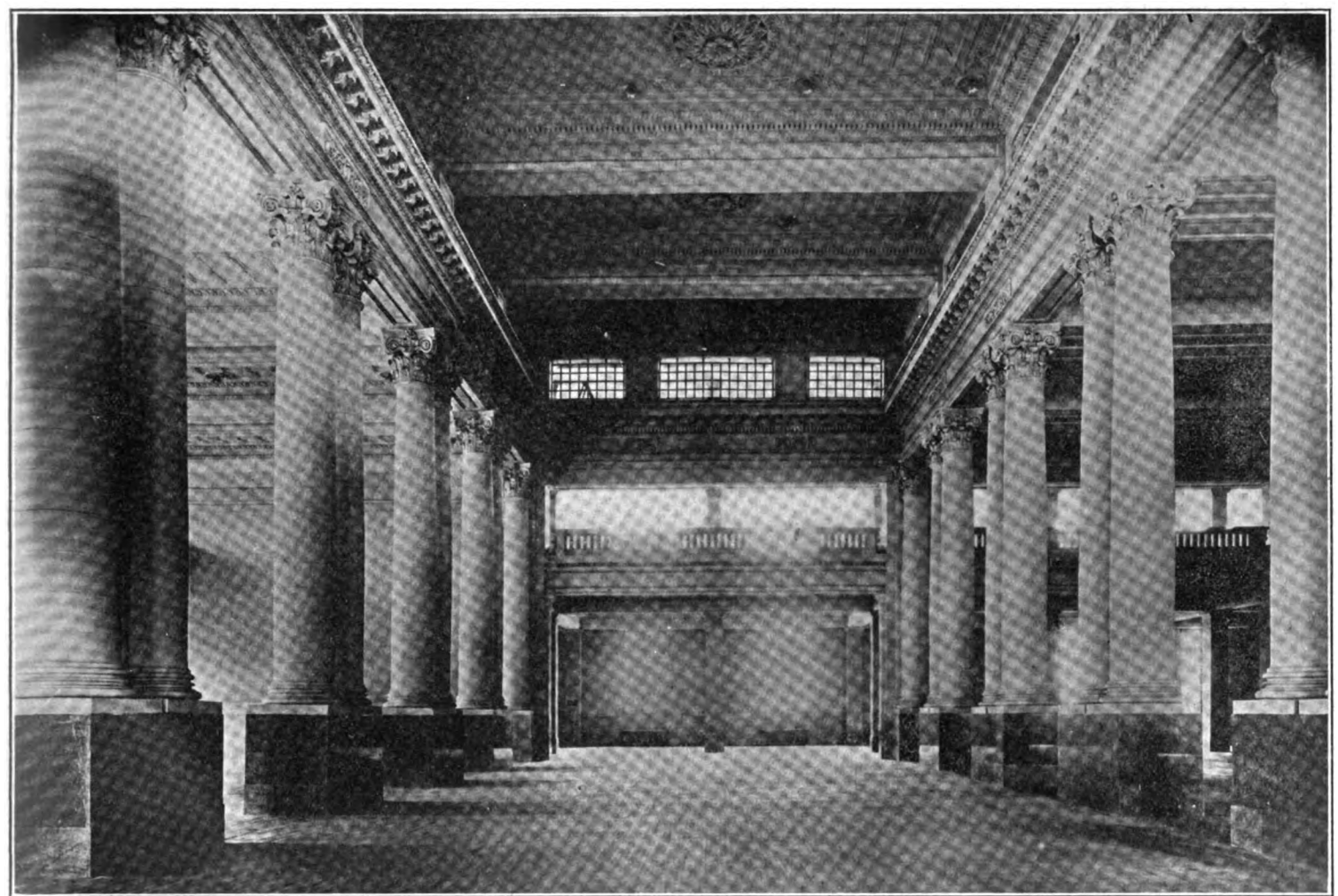
The ceremony took place on Wednesday afternoon, 3d inst., at the Hotel Rector, New York City, and was made the occasion of a love feast tendered to men prominent in the trade and sport. In the absence of President Hooper of the A. A. A., Chairman A. G. Batchelder acted as toastmaster, and played the part surprisingly well. The presentation speech was made by Mr. Glidden, and Mr. Briscoe accepted it, both in appropriate addresses. A silent toast was drunk to the memory of Samuel M. Butler, the late chairman of the A. A. A. contest board, who lost his life on the last Glidden tour, and to Joseph E. G. Ryan, of the Chicago Inter-Ocean, who died on Tuesday morning.

Cranked with Gears in Mesh; Usual Result.

Another of those peculiar accidents due to the carelessness of the chauffeur in leaving the gears in mesh and the emergency brake released, took place last week in Wabash, Ind., and as a result John Flora is in the hospital in a critical condition, but remarkable to state, Flora was not the man who cranked the car. The driver of the car had stepped forward to "spin" the motor and had barely given a half turn of the crank, when the machine lurched forward, gathering speed as it zigzagged down the street. A number of pedestrians had narrow escapes from being knocked down, but Flora could not dodge in time and was run over. The car crashed into the side of a house, after having mounted the sidewalk and knocked down a lamp post.

WESTERN PRODUCTIONS THE FEATURE OF PALACE SHOW

Will Be So Numerous as to Make It Almost a "Western Show in the East"—More Eastern Trucks Than Eastern Cars Will Be in Evidence.



GENERAL VIEW OF CENTRAL COURT IN THE NEW GRAND CENTRAL PALACE

When on Tuesday next, 10th inst., the National Association of Automobile Manufacturers inaugurates its show in the new Grand Central Palace, there will exist no "hard feelings" against the "other fellows down the way"—that is to say, against the exhibitors in the Board of Trade's show at Madison Square Garden. It will be the first time that two rival shows have held the boards in New York without the existence of more or less of such feelings.

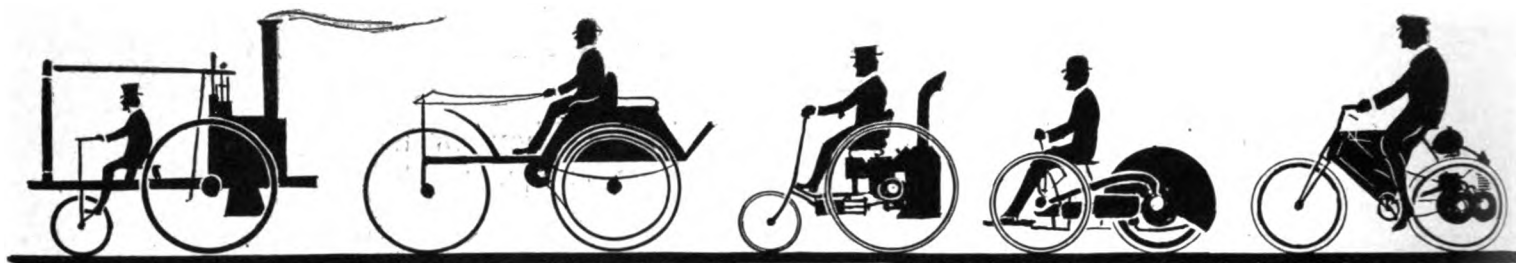
The "dynamiting" of the Selden patent last January removed the chief cause, and all other organizations being out of the way, the close bond of harmony which exists between the Board of Trade and the National Association of Automobile Manufacturers has been made much plainer. The members of one always have dominated the other; as a matter of fact, the offices of the two organizations in New York are side by side in the same building, and the entente cordiale is such that although the

Board of Trade holds the lease on the new Palace it transferred it to the N. A. A. M. in order that the forthcoming show might be made possible. Incidentally, there will be no Madison Square Garden after the present year, and the new Grand Central Palace with the enormous annex which will be erected during the next twelve-month will be the scene of all future shows. The year 1913 will mark the beginning of a new "one show" era.

In speaking of Grand Central Palace, it is necessary to emphasize the "new." For the present structure bears no relation to the old one in which previous rival shows were staged. The ramshackle, barn-like Palace which housed the "independent" show in January, 1911, and which required that a wealth of bunting be used to hide its nakedness, was a thing apart from the present superb structure of gray sandstone and brick without, and marble effects within. These effects are such that little, if

any, decorations are required. It will be practically unadorned. The new Palace lacks the arena which lends so greatly to Madison Square Garden—and which will be a feature of the Palace Annex—and because thereof the display cannot be all that might be wished and hoped for. But for all that the interior of the Palace with its marble stairway, its open court, its majestic Corinthian columns, and its three terraced galleries, is so imposing that much can be forgiven.

While the show in the Garden will be given wholly to pleasure vehicles the exhibition in the Palace will be made up of both cars and trucks—little ones and big ones. By comparison with the display of accessories in the Garden, the Palace show will be rather meager. Of a total of 138 exhibitors, but 59 display accessories. The vehicles that will be disclosed, however, will comprise a notable array. There will be 38 exhibits of gasoline pleasure



cars, 34 of commercial vehicles and seven of electric vehicles. The gasoline cars include even the Rambler, whose makers for several years refused to "take sides," and who perforce exhibited only in their own salesrooms. And the Ramblers that will be displayed will be the most imposing that ever bore the name. The Rambler comes from the West, and, in truth, the Palace show is almost a Western show. The Abbott and the Warren, the Cole and the Colby, the Hupmobile and the R. C. H., the Krit and the Imperial, the Cutting and the Cino, the Lion, the Regal, the Velie, the McFarlan and the Westcott, likewise the Great Western, the DeTamble,

the Stutz, Marion, Auburn, Stuyvesant—all will be there, and disclose that individuality that goes with the West. It will mark the very first public appearance of the R. C. H. and the Stutz. The Bergdoll, the Fiat, the Kline, the Metz and the Middleby are practically the sole representatives of the East. Similarly, all the electrics, the Babcock, the Argo, the Baker, the Standard and the Waverley are of the West, or near it. In the truck exhibits the East will be more largely represented. The Eclipse, the Newark, the Koehler, the Lippard-Stewart, the Sanbert, the Sullivan, the Vandewater and the Walter, all Eastern productions, will make their first appear-

ances at any show, side by side with the Atterbury, the Gramm, the Dayton, the Kelley, the Lauth-Juergens, and the Commer, all of well-established manufacturers. The new Western trucks that will be displayed for the first time are the Best, the Universal, the Rassel.

So numerous have been the shifts of locations since the allotments first were made, that not even the show management has been able to keep pace with them. Space numbers previously assigned and which have appeared in print are therefore meaningless. The full list of exhibitors, necessarily devoid of space locations and numbers, is as follows:

The Cars and Trucks That Will be Exhibited in the Palace

Pleasure Vehicles.

Abbott Motor Co., Detroit, Mich.—Abbott-Detroit.
Ames Motor Car Co., Owensboro, Ky.—Ames.
Auburn Automobile Co., Auburn, Ind.—Auburn.
Bergdoll Motor Car Co., Louis J., Philadelphia, Pa.—Bergdoll.
Clarke-Carter Automobile Co., Jackson, Mich.—Cutting.
Colby Motor Co., Mason City, Iowa—Colby.
Cole Motor Car Co., Indianapolis, Ind.—Cole.
Columbus Buggy Co., Columbus, Ohio—Firestone-Columbus.
Crow Motor Car Co., Elkhart, Ind.—Crow-Elkhart.
De Tamble Motor Co., Anderson, Ind.—De Tamble.
Elkhart Carriage and Harness Co., Elkhart, Ind.—Pratt-Elkhart.
Fiat Automobile Co., Poughkeepsie, N. Y.—Fiat.
Great Western Automobile Co., Peru, Ind.—Great Western.
Haberer & Co., Cincinnati, Ohio—Cino.
Havers Motor Car Co., Port Huron, Mich.—Havers.
Herreshoff Motor Co., Detroit, Mich.—Herreshoff.
Hupp Corporation, Detroit, Mich.—R. C. H.
Hupp Motor Car Co., Detroit, Mich.—Hupmobile.
Ideal Motor Car Co., Indianapolis, Ind.—Stutz.
Imperial Automobile Co., Jackson, Mich.—Imperial.

Jeffery Co., Thos. B., Kenosha, Wis.—Rambler.
King Motor Car Co., Detroit, Mich.—King.
Kline Motor Car Co., York, Pa.—Kline.
Krit Motor Car Co., Detroit, Mich.—Krit.
Lion Motor Car Co., Adrian, Mich.—Lion.
McFarlan Motor Car Co., Connorsville, Ind.—McFarlan.
Marion Motor Sales Co., Indianapolis, Ind.—Marion.
Metz Co., Waltham, Mass.—Metz.
Middleby Auto Co., Reading, Pa.—Middleby.
Paige-Detroit Motor Car Co., Detroit, Mich.—Paige-Detroit.
Paterson Co., W. A., Flint, Mich.—Paterson.
Penn Motor Car Co., Pittsburgh, Pa.—Penn 30.
Regal Motor Car Co., Detroit, Mich.—Regal.
Stuyvesant Motor Car Co., Cleveland, Ohio—Stuyvesant.
The Motor Car Mfg. Co., Indianapolis, Ind.—New Parry.
Velie Motor Vehicle Co., Moline, Ill.—Velie.
Warren Motor Car Co., Detroit, Mich.—Warren-Detroit.
Westcott Motor Car Co., Richmond, Ind.—Westcott.

Commercial Vehicles.

Atlantic Motor Truck Co., New York City—Rassel.
Atterbury Motor Car Co., Buffalo, N. Y.—Atterbury.
Bowling Green Motor Car Co., Bowling Green, Ohio—B. G. O.

Bushnell Press Co., G. H., Thompsonville, Ct.—Maxim Tricar.
Cass Motor Car Co., Port Huron, Mich.—Cass.
Chase Motor Car Co., Syracuse, N. Y.—Chase.
Cortland Motor Wagon Co., Pittsfield, Mass.—Cortland.
Dart Mfg. Co., Waterloo, Ia.—Dart.
Dayton Auto Truck Co., Dayton, Ohio—Dayton.
Decatur Motor Car Co., Decatur, Ind.—Decatur.
Durant-Dort Carriage Co., Flint, Mich.—Best.
Eclipse Truck Co., Franklin, Pa.—Eclipse.
Federal Motor Truck Co., Detroit, Mich.—Federal.
Gramm Motor Truck Co., Lima, Ohio—Gramm.
Kelly Motor Truck Co., Springfield, Ohio—Kelly.
Knickerbocker Motor Truck Mfg. Co., New York City—Knickerbocker.
Lauth-Juergens Motor Car Co., Fremont, Ohio—Lauth-Juergens.
Lippard-Stewart Motor Car Co., Buffalo, N. Y.—Lippard-Stewart.
Motor Wagon Co., Detroit, Mich.—Motor Wagon.
Newark Automobile Manufacturing Co., Newark, N. J.—Newark.
New York Auto Wagon Co., Brooklyn, N. Y.—New York.
Packers Motor Truck Co., Wheeling, W. V.—Packers.
Parker Motor Wagon Co., New York City—Parker.



Progress Development Co.,—Maximus.
Schacht Motor Car Co., Cincinnati, Ohio—
Schacht.
Schlotterback Mfg. Co., L. E., East Orange,
N. J.—Koehler.
Sanford-Herbert Co., Syracuse, N. Y.—
Sanbert.
Sullivan Motor Car Co., Rochester, N. Y.—
Sullivan.
Universal Motor Truck Co., Detroit, Mich.
—Universal.

Velie Motor Vehicle Co., Moline, Ill.—Velie.
Vanderwater & Co., Elizabeth, N. J.—Van-
derwater.
Veerac Sales Co., Paterson, N. J.—Veerac.
Walter Automobile Truck Mfg. Co., New
York City—Walter.
Wyckoff, Church & Partridge, New York
City—Commer.

Electrics.

Argo Electric Vehicle Co., Saginaw, Mich.
—Argo.

Babcock Electric Car Co., Buffalo, N. Y.—
Babcock.
Colonial Electric Car Co., Detroit, Mich.—
Colonial.
Ohio Electric Car Co., Toledo, Ohio—
Ohio.
Standard Electric Car Co., Jackson, Mich.
—Standard.
Walker Vehicle Co., Chicago, Ill.—Walker.
Waverley Co., Indianapolis, Ind.—Waver-
ley.

The Accessories That Will Be Shown in the Palace

Auto Specialty Co., Toledo, Ohio—Ac-
cessories.
Automatic Motor & Mfg. Co.,—Chicago,
Ill.—Motors.
Automobile Journal Publishing Co., Paw-
tucket, R. I.—Publications.
Blickensderfer Co., G. C., Stamford, Conn.
Booth Demountable Rim Co., Cleveland,
Ohio—Booth demountable rims.
Bowser & Co., S. F., Ft. Wayne, Indiana
—Bowser fuel and oil storage systems.
Bricton Mfg. Co., Brookins, S. D.—Tire
treads.
Breeze Carburetter Co., Newark, N. J.—
Breeze carburetters.
Cramp & Son Ship and Engine Bldg. Co.,
Wm., Philadelphia, Pa.—Bronze and bear-
ing metals.
Dean Electric Co., Elyria, Ohio—Tuto
horns and Dynalux lighting systems.
Dyneto Electric Co., Syracuse, N. Y.—Ig-
nition and lighting apparatus.
DeVilbiss Mfg. Co., Toledo, Ohio.
Diamond Rubber Co., Akron, Ohio—Dia-
mond tires.
Edison Storage Battery Co., West Orange,
N. J.—Storage batteries.
Faw, J. H., New York City.
Firestone Tire & Rubber Co., Akron, Ohio
—Firestone tires and rims.
Fisk Rubber Co., Chicopee Falls, Mass.—
Fisk tires and inner tubes.
Four Wheel Auto Jack Mfg. Co., Reading,
Pa.—Four wheel automobile jack.
G. & A. Carburetter Co., New York City—
G. & A. carburetters.
Gemmer Mfg. Co., Detroit, Mich.—Steering
gears and parts.
Goodrich Co., B. F., Akron, Ohio—Good-
rich tires.
Goodyear Tire and Rubber Co., Akron,
Ohio—Goodyear tires.
Gray & Davis, Amesbury, Mass.—Lamps
and lighting dynamos.

Hartford Suspension Co., Jersey City, N. J.
—Truffaut-Hartford shock absorber.
Havers Motor Car Co., Port Huron, Mich.
—Havers.
Herreshoff Motor Co., Detroit, Mich.—
Herreshoff.
Horseless Age, New York City—Publica-
tions.
Lavigne Mfg. Co., Detroit, Mich.—Gears.
Motz Clincher Tire and Rubber Co., Akron,
Ohio—Motz cushion tires.
McCue Co., Buffalo, N. Y.—Axles.
Miller, Charles E., New York City—Sup-
plies.
Modern Auto Appliance Co., Chatham,
N. Y.—Anti-skid chains.
Motor, New York City—Publications.
Motor Vehicle Publishing Co., New York
City—Publications.
Motor World Co., New York City—The
Motor World.
Motor Print Co., Philadelphia, Pa.—Publi-
cations.
Muncie Gear Works, Muncie, Ind.—Trans-
missions and gears.
National Carbon Co., Cleveland, Ohio—Dry
cells.
National Pump Co., Dayton, Ohio—Tire
pumps.
Pacific Coast Borax Co., New York City.
Peck-Wheeler Co., Chicago, Ill.
Power Wagon Publishing Co., Chicago, Ill.
—Publications.
R. I. V. Co., New York City—R. I. V. ball
bearings.
Remy Electric Co., Anderson, Ind.—Remy
magnetos and lighting apparatus.
S. K. F. Ball Bearing Co., New York City
—S. K. F. ball bearings.
Sewell Cushion Wheel Co., Detroit, Mich.—
Spring wheels.
Shore Instrument Mfg. Co., New York City
—Testing instruments.
Spindler & Oeringer, Jersey City, N. J.

Standard Wrench & Tool Co., Providence,
R. I.—Standard wrenches and tools.
Stromberg Motor Devices Co., New York
City—Stromberg carburetters.
Swinehart Rubber & Tire Co., Akron, Ohio
—Tires.
The Motor Car Mfg. Co., Indianapolis, Ind.
—New Parry.
Thompson Automobile Co., A. C., Plain-
field, N. J.
Timken-Detroit Axle Co., Detroit, Mich.
—Axles and bearings.
United States Tire Co., New York—Hart-
ford, G. & J., Morgan & Wright, Contin-
ental and United States tires.
Veeder Mfg. Co., Hartford, Conn.—Veeder
speedometers and odometers.
Volkmar Automobile Starter Co., New
York City—Engine starters.
Wayne Oil Tank & Pump Co., Ft. Wayne,
Ind.—Tanks and pumps.
Wheeler & Schebler, Indianapolis, Ind.—
Schebler carburetters.
Warner Instrument Co., Beloit, Wis.—War-
ner autometers and odometers.

Automobiles Blamed for Coffee's Rise.

Excepting the artistically inclined Eng-
lishman, who last month declared that the
automobile is responsible for the decline
of high art, no new charges against the
motor car have been filed for some time.
That this, however, was but, so to say,
the calm before the storm, is evident from
the vigor with which new enemies attack
the automobile. Some Southern coffee
brokers, for instance, being at a loss to
explain the sudden rise in the prices of
Brazil coffee, pounced on the motor car and
branded it as the arch enemy of the coffee
dealer. They claim that the enormous in-
crease of motoring has boomed the price
of rubber so high that coffee growers quit
growing coffee and planted rubber trees.

"POPPETVALVELESSNESS" AT THE IMPORTERS' SALON

Two New Foreign Engines Constitute the Only Conspicuous Novelty at Show in Astor Ballroom
—Several Minor Conceits in Body Design and Appointment.



GENERAL VIEW OF IMPORTERS' SALON IN BALL ROOM OF HOTEL ASTOR

Why the Importers Salon—as the exhibition of imported automobiles in the ball room of the Hotel Astor officially is styled—should have been opened on Tuesday last with a Russian march, is a mystery that would tax the solving powers of Sherlock Holmes, for as a matter of fact Russia is about the only one of the more important European nations not represented by at least one motor car. Six other nations show their wares, and what these wares lack in number and impressiveness, they endeavor to make up by gorgeousness in the surroundings, exclusiveness in attendance and—not to forget—the “open face” clothes of the salesmen and the majority of the evening visitors. The magnificence of the ballroom renders borrowed decorations unnecessary.

Separated from each other by white round pillars supported on square pedestals the various exhibits offer a pleasing contrast to the eye, with the dark blue, green or black bodies, and bright chassis reposing on red carpeting. The parlor aspect is

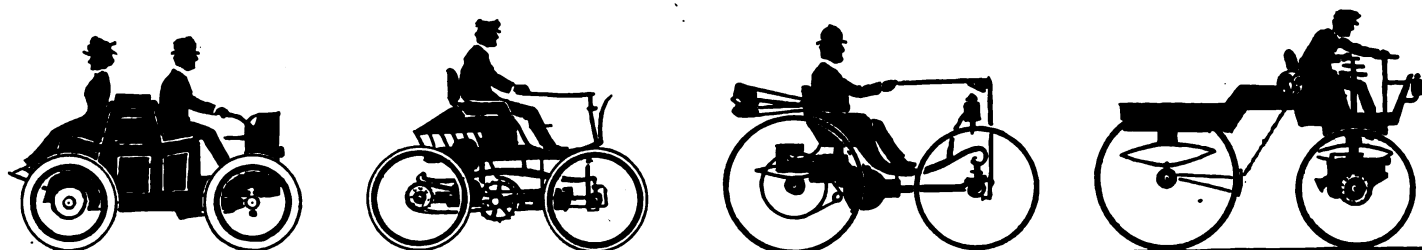
further enhanced by the small number of visitors examining the cars, and, contrasted with the shows in the big public buildings without distracting in the least from its dignity, it may be said that the show is almost a “band-box” affair.

Fifteen exhibitors stage 62 cars and chassis, and it is notable that only a single car is finished in light colors, this being a Minerva Berline with a bright yellow body. The rest of the bodies are painted in somber blacks or blues, or greens. Undoubtedly the most remarkable body—to use a mild expression—is a two-passenger traveling coach with Sedan chair effect, which is shown on the stand of the Metallurgique Motor Co. This car is fitted with a wide trunk rack in the rear, a coupe-like body, and a skuttle dash of enormous proportions—almost a coal chute—extending fully three feet from the dashboard towards the driver's shoulders. As a result the dashboard gives one the impression as if it were hidden in a dark, black hole, while the whole arrangement looks extremely dan-

gerous for a driver to be caught in in case of accident. This rather freakish body is mounted on a wheel base of at least eleven feet, accentuating the peculiarities of its construction. Strange to say, only two six-cylinder machines are exhibited, one of them made in the Fiat factory in Poughkeepsie, N. Y., the other a Renault of 40-50 horsepower.

From a mechanical point of view the show—which will hold the boards until next Wednesday—is notable chiefly for the presence of four cars equipped with Knight engines—the Mercedes, Panhard, Minerva and English Daimler, one with a Pic-Pic-Argyle motor and one with a Henriod.

The Mercedes Knight is shown in an exhibition chassis, shaft driven, and is of 40 horsepower, with gear-driven camshaft and single spark plug and high-tension magneto. There is no manual control of the ignition timing, there being a centrifugal governor which automatically advances the spark as the speed of the engine increases. The engine does not embody any



new features. It is rather noticeable that in this, as in the other Knight engines shown, little attention has been given to the exterior finish, the cylinder castings being quite rough and given a coat of black enamel, in which they differ from most of the foreign-built engines. The English Daimler Silent Knight is of 25 horsepower and differs in no way from the German-made sleeve motor, except in point of size. It is installed in a five-passenger touring car with the wire wheels that are so popular in England. In the case of the Panhard Knight, a 30 horsepower engine shown in a chassis, the valve camshaft is driven by chain, but otherwise it is not different from the others. The fourth Knight-engined car, the Minerva, is a Belgian product and is different from cars with double sleeve motors in that it has worm drive to the rear axle, the worm being of the so-called "hour-glass" type. As in the Mercedes the ignition timing is controlled by a centrifugal governor, which is enclosed in a neat cylindrical case placed close to the high-tension magneto.

Almost invariably the foreign cars are built along lines similar to those of the models of last year, and in many cases of several years back, and changes are even less frequent than in American machines. However, the Piccard-Pictet—the "Pic-Pic" as it is termed—has really made a radical change in adopting in one of its models an engine that is called "valveless," but which is really of the sleeve-valve type, having, however, but a single sleeve which moves on its axis as well as vertically. At the bottom of each sleeve is a stud which engages with a rotating driver to which motion is imparted from a longitudinal shaft by worm gears. Ports in the sleeve alternately cover and uncover the intake and exhaust ports in the cylinder walls, thus doing the work accomplished by the two sleeves of the Knight. While an engine of this type was exhibited, "valveless" cars will not be ready for delivery until early in the summer of 1912.

An ingenious little air pump is one of the features of the Pic-Pic car. This con-

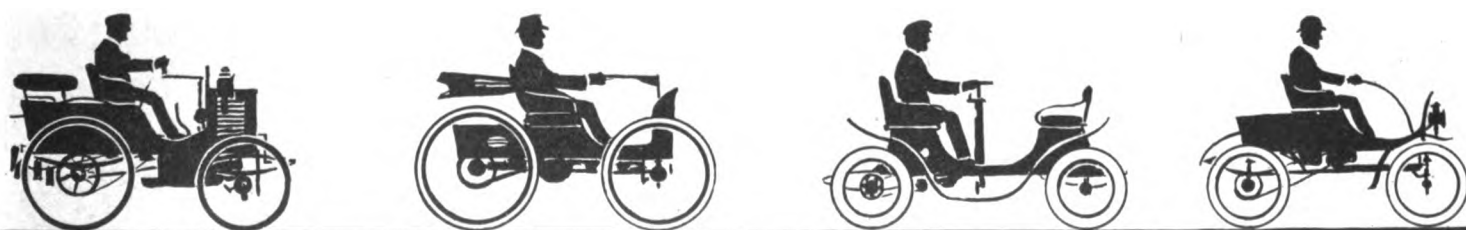
sists of a cylinder and piston placed on the removable cover of the gearcase, with a small gear to drive it, the gear meshing with one of the gears in the case when the cover is placed in position.

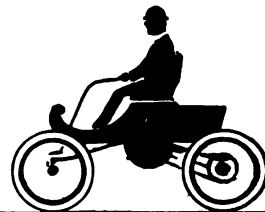
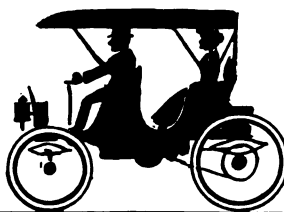
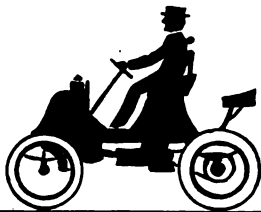
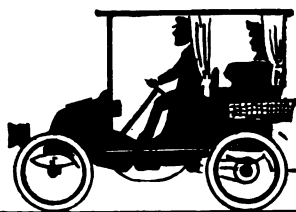
Another non-poppet valve motor is the Henriod. This engine has a single long rotary valve running the length of the four block-cast cylinders and driven by worm gearing from a vertical shaft, both shaft and gearing being enclosed in an aluminum casing. A single port in each cylinder serves for both intake and exhaust, the valve placing it in communication alternately with the carburetter and with the exhaust passages. There are some decidedly neatly worked out features in this engine. For instance, the difficulty of adequately lubricating such a long valve has been cleverly met. Instead of allowing the valve to take its bearing directly against the walls of the cylindrical "tunnel" in which it rotates, it is carried in two very large ball bearings, one at each end of the valve. The valve is finished about six thousandths of an inch smaller than the "tunnel" and is so accurately centered by the ball bearings that it does not actually touch the walls, but the space is filled by a film of oil, which is not subjected to pressure. It is claimed that this arrangement is not interfered with by the distortion of the castings by heat. In order to protect the valve from the direct pressure and heat of the exhaust gases, immediately after ignition, when the pressure is the highest and the heat the greatest, the piston is made to ascend and cover the port and rise a little above it. Thus the ignition occurs when the port is covered, and by the time the piston has descended far enough to uncover the port, the high initial pressure and heat have subsided considerably, and the valve is well able to withstand without injury, what remains. It would seem that there would be a considerable quantity of burned gas left in the cylinder after each exhaust stroke, with no possibility of scavenging it out, but it is stated that it is so small that no ill effects are apparent. The makers claim that the

output of the engine is 36 horsepower at 1,700 revolutions per minute, the bore being 3 13-16 inches and the stroke 5 5-8 inches, which would seem to indicate that there is no serious loss of power through the lack of scavenging. This engine is installed in a bare chassis with worm drive. The motor is thermo-siphon cooled.

No little interest is manifested in the big Mercedes 90-horsepower chassis, the engine of which is a duplicate of that used in the Savannah races. The long cylinders topped by two exhaust and one intake valve each, with a separate rocker arm and spring for each valve produce an impression of anything but simplicity. Two independent ignition systems are fitted. A practical but not particularly ornamental arrangement is the connecting of the exhaust passages of the cylinders to the muffler by two of these connections, one from each pair of cylinders. As this machine is a touring car, notwithstanding its powerful motor, silence of operation is a desideratum, and having a big engine to "silence" there is an expansion chamber into which the exhaust pipes discharge directly, and also muffler proper, of approximately the same size, the two being connected by a steel pipe and directly in line along the left hand side of the chassis, on the outside.

On the Isotta-Fraschini chassis, which in practically all major features is unchanged from last year, there is a universal joint of a type which, though old and simple, has given such excellent results that it is rather a wonder it has not oftener been used in motor cars. It consists of a disk of very heavy leather stretched across the driving member, which is formed like a small recessed flywheel, the arrangement being very like that of a drum. At the center of the disk the driven shaft is connected by means of a pair of flanges which grip the leather firmly between them. The outer edge is held by a ring which is bolted down hard on the leather. The great flexibility of this point and its absence of wearing parts, as well as its silence and elasticity, render it well adapted to motor car driving.





One of the cleanest looking motors in the show is the four-cylinder Lancia with cylinders cast "en bloc." One reason for its clean appearance is that the upper water passage is cast along the entire length of the tops of the cylinders integral with them, and the pipe connecting with the radiator is a very short one tapped into the front end of the cast passage. The valve mechanism is entirely enclosed, adding still further to the neatness of the engine.

American body work was quite conspicuous, and in no wise suffered from comparison with the best the foreigners had to offer. Among others were two bodies by Holbrook, one a limousine on a Renault chassis and the other a touring body on a Metallurgique chassis. Under the deep skuttle of the touring car were placed two very convenient little boxes available for small tools and the like—one on each side of the dash, occupying space of no use for anything else. In this car the change-speed lever was placed inside and the emergency brake lever outside of the closed front. Another handsome American body was a landaulet by Demarest on a Renault chassis. On the roof are the familiar rails to retain tires and other impedimenta, and on the body just back of the chauffeur's seat is a sheet-steel step by which the roof can be reached. Among the foreign-built bodies, two enclosed cars on Metallurgique chassis had ingenious folding seats for two extra passengers, the seats in one folding flat against the back of the chauffeur's seat and in the other collapsing and sliding under the rear seat.

While there is nothing new in placing on the back of the chauffeur's seat a wind-shield to protect the occupants of the rear seat, an English Napier car shown was fitted with a very ingenious development of this appliance. This consists of a wind-shield of celluloid made in three parts hinged together like the familiar triple mirror, the two wings extending backward when required and folded flat against the central part when not needed. When the windshield is not needed at all, it swivels down and folds flat against the front of the

tonneau interior. The shield can be moved horizontally so as to be brought closer to the passengers if desired, the space between the bottom of the shield and the front seat being filled by a waterproof fabric. Lastly, it can be set and held at any angle the direction of the wind may demand.

The following is a complete summary of the cars on view:

Adams Automobile Co., T. E., New York City.—One 30 horsepower four-cylinder, shaft driven, polished Lancia chassis and one limousine town car on similar chassis.

Allen, W. C. & H. M., New York City.—One Metallurgique landaulet and one limousine on 30 horsepower shaft driven chassis; one limousine and a phaeton on 40 horsepower chassis; one 60 horsepower shaft driven limousine.

Benz Auto Import Co., New York City.—One 50 horsepower shaft driven polished chassis, with a water-cooled four-cylinder motor; two limousines on 30 horsepower shaft driven chassis; two limousines on 50 horsepower chassis; one combination touring car and landaulet on a 50 horsepower chassis; one Benz racer and the first Benz made.

Cesare Conti, New York City.—One S. P. A., shaft driven, polished chassis, with a four-cylinder water-cooled motor.

Daimler Import Co., New York City.—One 90 horsepower, chain driven Mercedes chassis; one polished chassis, shaft driven equipped with a 40 horsepower Knight motor, and one 45-50 horsepower limousine.

Ducasse & Co., New York City.—One Charron fore door limousine; 18-20 horsepower; water cooled motor; one 25-30 horsepower convertible limousine; one 12-15 horsepower landaulet; one 16-25 horsepower Darracq touring car, with a Darracq-Henriod rotary valve motor, and worm gear drive.

De Dion-Bouton Selling Branch, New York City.—One eight-cylinder, 30 horsepower, shaft drive, polished chassis; one landaulet on a similar chassis; three touring cars on one 10, one 20, and one 40

horsepower chassis, with four-cylinder motors; one 20 horsepower four-cylinder limousine; one 10 horsepower chassis with four-cylinder motor, and one 100 horsepower eight-cylinder, polished chassis.

Glentworth, C. C., New York City.—One six-cylinder 45 horsepower Napier touring car, shaft driven, equipped with wire wheels, and one four-cylinder convertible limousine of 15 horsepower.

LaCroix Auto Co., Paul, New York City.—One Daimler touring car and one limousine on shaft driven chassis, equipped with 25 horsepower Knight motor and wire wheels; one Zedel town car with 12-15 horsepower motor; one Itala 40 horsepower limousine with a four-cylinder rotary valve motor; one Renault 18-24 horsepower limousine.

Panhard & Levassor, New York City.—One polished chassis, equipped with a 30 horsepower four-cylinder Knight motor and one collapsible torpedo landaulet; one collapsible Berline, and two seven-passenger limousines, all on the 30 horsepower chassis.

Peugeot Import Co., New York City.—One 22-43 horsepower, polished chassis, shaft driven.

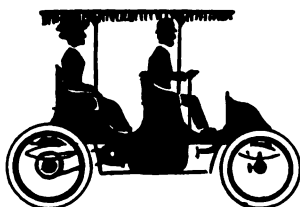
Piccard-Pictet Motor Co., New York City.—One polished chassis equipped with a 45 horsepower Knight motor; one roadster on the same chassis.

Quinby & Co., J. M., New York City.—Isotta-Fraschini, polished chassis, shaft drive, 25-35 horsepower, cast "en bloc" four-cylinder motor; one chain driven chassis, 120 horsepower four-cylinder motor; one 35-45 horsepower limousine.

Renault Freres Selling Branch, New York City.—One shaft driven chassis, 35-45 horsepower, four-cylinder motor; one 30-40 horsepower limousine; two limousines on shaft driven chassis with six-cylinder motors 18-24 horsepower; special body limousine on shaft driven chassis, 30-40 horsepower, four-cylinder motor.

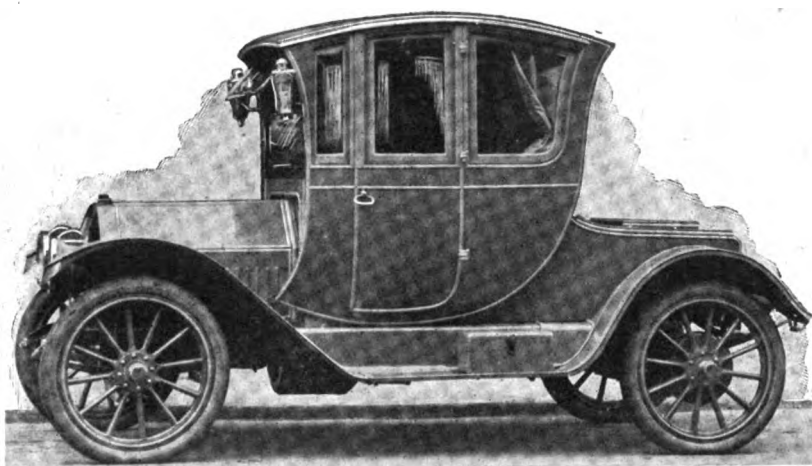
Sewell, F. W., New York City.—One Minerva polished chassis, equipped with one 16 horsepower Knight motor, and worm gear drive; one landaulet on a similar chassis, and one limousine on a 26 horsepower chassis.

The Holbrook Co., New York City.—Two special bodies, one on a Metallurgique, and one on a Renault.





The Development of the Coupe



BUICK COUPE

Though the past year in the automobile world has been a notable one from nearly every point of view there are several developments that stand higher than others and the shadows they cast in the light of previous practice are far from insignificant. One of the most important developments—one which scarcely can have escaped the notice of even the casual observer—is the remarkably increased popularity of the closed car for all year service. The limousine is, of course, a standard product, a product that has become familiar through years and years of use, and though the recent development of limousines of the "Berline" type and their increased use undoubtedly is a factor to remark, the really important development is the inside driven coupe, and the Colonial coupe in particular. The latter is essentially one of the notable developments of the past year. Of course, the Berline limousine is the acme of comfort. But it is a big car in every

sense of the word and has had not a few of the drawbacks, financial and otherwise, that go with bigness. Usually it signifies a large purse and that its use undoubtedly will continue to increase it is safe to say that it never will equal the coupe in public esteem, for the coupe appeals to the greatest number and is within reach of the greatest number of purses.

Obviously, the reason for the popularity of the inside driven coupe is logical. It is the outcome of a natural demand for an all-weather car and for greater comfort, and although Prior is authority for the statement that comfort flows from ignorance, and that only the wise are wretched if his utterance be looked at in another light, it would require a pretty big stretch of the imagination to fancy that the person who is wise enough to purchase a closed car for all year service is ignorant, or can be wretched in its use.

The present day custom is in marked

contrast to that of a few years ago when cars were stored almost with the advent of the first snows. There then were those who used their cars all the year just as there are at present, but whereas the majority of owners preferred to forego the pleasures (to some they are not pleasures) of winter motoring, conditions have changed and each year sees more cars kept in commission the year around.

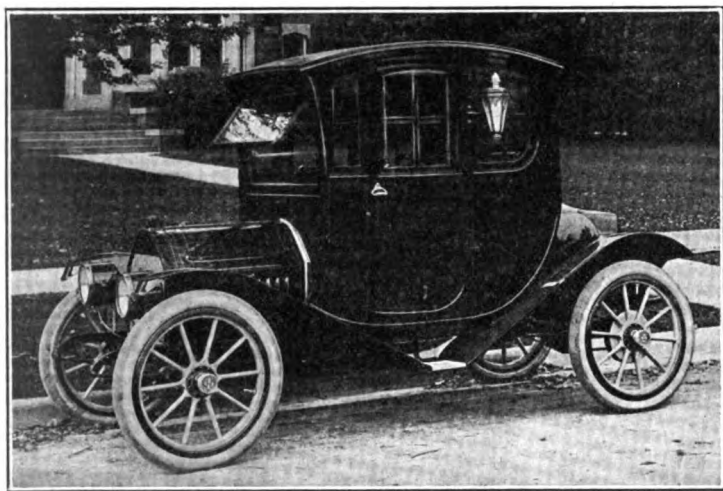
At its best, the open car is not the most comfortable of diligences "when wintry winds do blow," however. Swift movement in a cold morrow usually chills to the very marrow. Even those so-called "warm-blooded" persons find it difficult at times to keep their feet, or other portions of their anatomy, at $98\frac{1}{2}$ degrees Fahrenheit, which, medical books state, is the normal temperature of the human body. Of course, such things are expected. The person who goes out in an open car in

and to them the coupe is indispensable. Though there are those who contend that it is essentially a town car, probably by reason of the fact that it seldom is used for other purposes, there is little reason for the contention. It is just as much an "out-of-town" car. Similarly, it is just as much a summer car as it is a winter car.

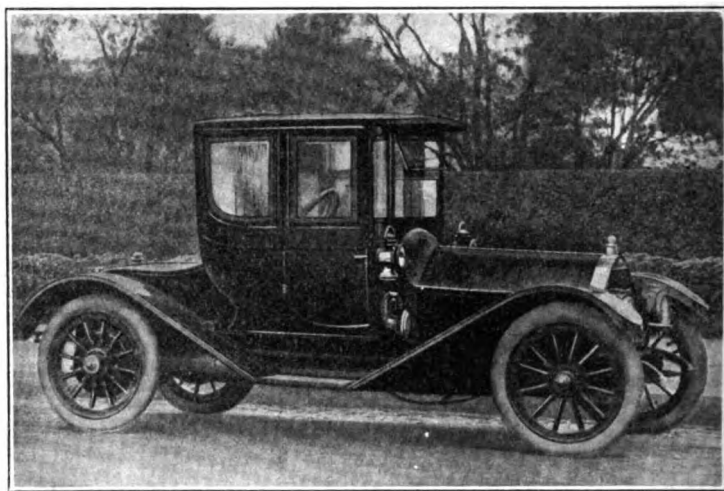
If there is anything that is more insidious than rain, it is dust, and even if the masculine members of the species can put up with it there is nothing the weaker sex abhors more, for which reason the inside driven coupe makes an undeniable appeal to Eve's daughters, who can flit about town, or out into the country without fear of injuring the finest of their Paris "creations." Add a self-starter, as a great many manufacturers do, and the inside driven coupe becomes the car par excellence for feminine use. It has a greater "cruising range" than its electric cousin, and, thanks to the

four-wheeled closed carriage with a seat for two and an outside seat for the driver." It is also defined as meaning the "half-compartment at the end of a first-class railway carriage, usually seating four persons," and as "the forward compartment of a French diligence." All the definitions nearly fit, as the word is understood in present motor car language, and still none of them fit exactly.

In the liberal interpretation of to-day, the word coupe is taken to mean a closed carriage, not necessarily low, with seats inside for two or possibly three persons. Also is generally understood to mean that there is no outside seat for the driver, though there is no authority for the distinction inasmuch as a coupe may be either inside-driven or outside-driven. Usually, they are inside-driven which accounts largely for the misinterpretation of the word.



HERRESHOFF



THOMAS

winter scarcely expects to keep as warm as he or she does in home surroundings. The expectation is to keep as warm as possible under numerous wrappings that alter the exterior appearance until it suggests that of the time-honored and historical Humpty-dumpty.

But even when the average individual is converted into a semblance of a Polar bear it does not necessarily follow that a weatherproof result is achieved. When it is really cold and it snows, furs may be relied upon to keep out a great deal of weather and reduce the chilling effects. Rain, however, is quite another thing, as any one who has attempted to ride in comfort in a storm can testify. It is the most insidious of Nature's elements, and when it "comes down in slanting lines," nor tops, nor multitudinous wrappings, nor furs are of avail; there always is some unsuspected spot where it can make its presence felt. Which, briefly, is the answer to the question: "Why the popularity of the coupe?"

It is the ideal light car for both winter and summer use. There are hundreds of professional men—doctors in particular—who must be out in all kinds of weather,

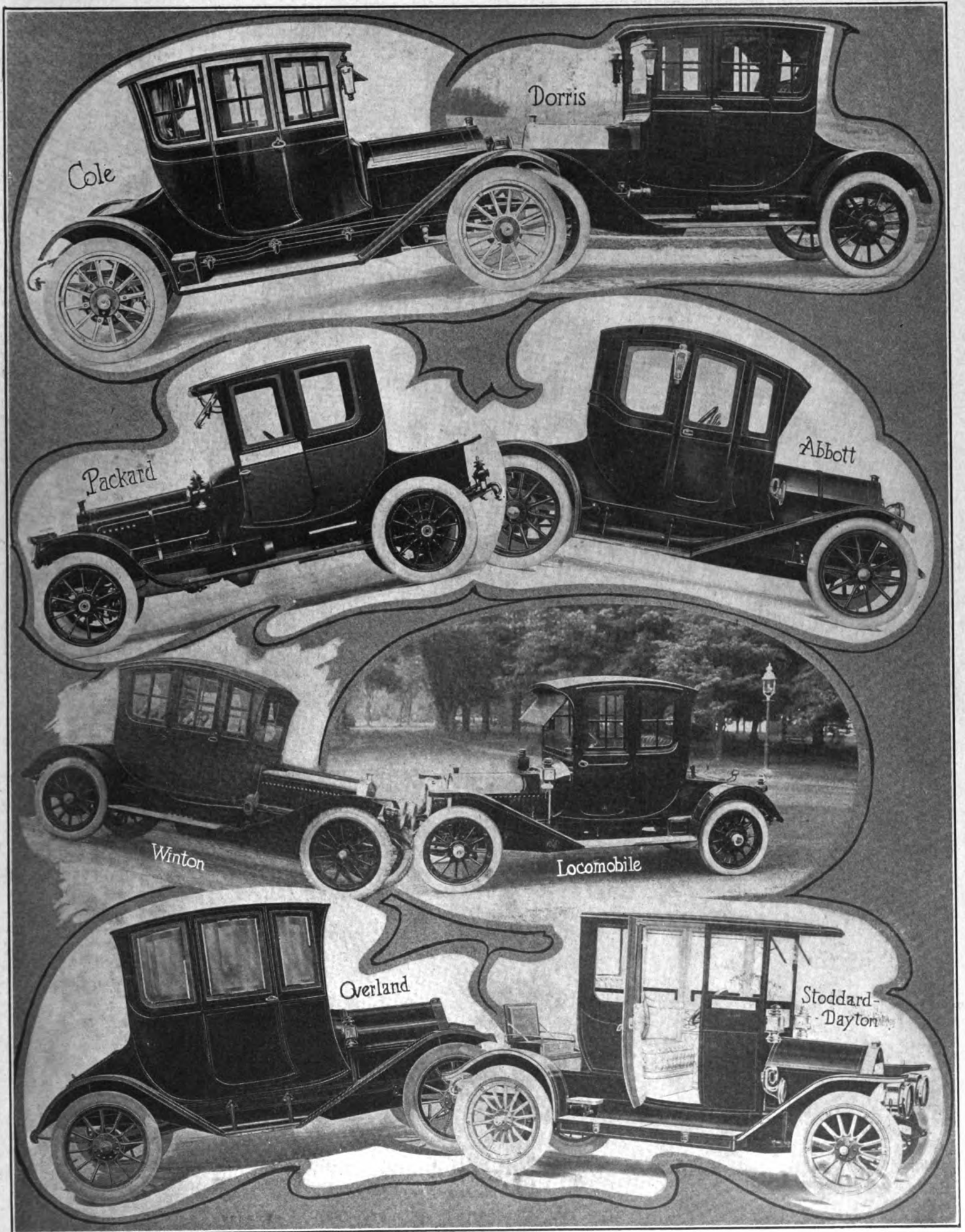
efforts of manufacturers to produce really simple mechanisms, it scarcely presents greater difficulty in operation.

Another factor which has materially increased the popularity of the inside driven coupe is that in many cases the body may be quickly and easily taken off and a touring or roadster body of orthodox pattern put on in its place. Thus, those who incline to the open car in summer, but for whom the rigors of winter driving in the same car are too severe may have, virtually, two cars at but little more than the cost of one. Furthermore, when the coupe is left unattended for a time, its doors may be locked and the added security in the knowledge that wraps and robes are safe from the attentions of gentlemen of pilfering proclivities is a by no means small argument in favor of this type of body.

It is perhaps unnecessary to interpolate a definition of the word coupe, though in view of the fact that the original meaning of the word has been stretched a little in applying it to modern conveniences it is not altogether irrelevant. The word coupe, as its spelling indicates, is of French origin and the preferred definition is: "A low

Subsequent to the "arival" of the ordinary type of coupe body, and in response to a demand for something out of the ordinary, or outre, as the French would have it, the Colonial coupe made its appearance and so quickly did it "catch on" that it bids fair soon to rival in numbers its predecessor. Apparently the only claim it has to the designation "Colonial" lies in the shape and construction of the windows for assuredly things colonial never approached in general outline the present day Colonial coupes.

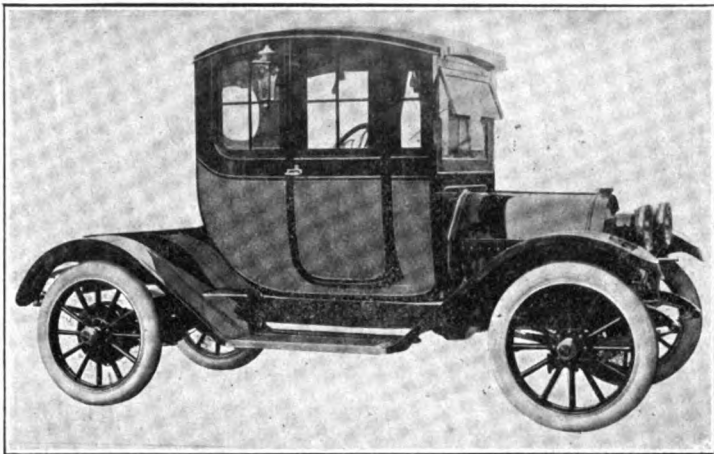
Those who have good memories for historical facts will have little difficulty in remembering that when colonists from European countries foregathered on American shores and put up primitive domiciles, glass was practically an unknown quantity. At least, it was so very expensive that only the wealthiest of the colonists could afford the luxury of real glass windows. Even those who could afford glass, were forced to be content with tiny panes, for the art of glass-making had not been developed to the state where large sheets were possible. Consequently, colonial homes took on a distinctive appearance by reason of the



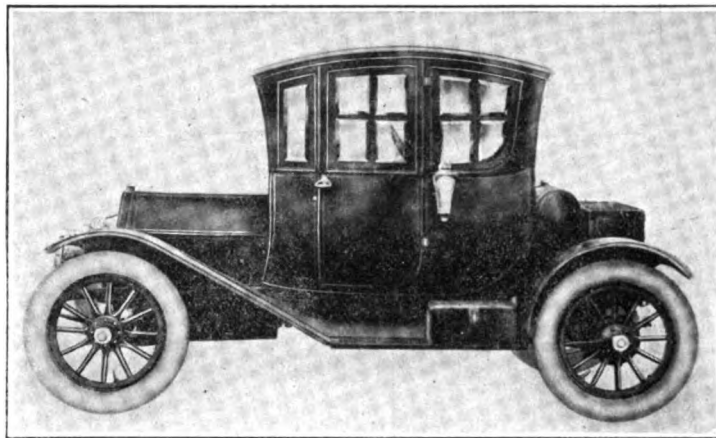
STRIKING TYPES OF COUPE DEVELOPMENT—COLONIAL AND OTHERWISE



STRIKING TYPES OF COUPE DEVELOPMENT—COLONIAL AND OTHERWISE



OAKLAND



PAIGE-DETROIT

many tiny panes of glass that were latticed together to make windows of respectable size. Diligences of colonial times were affairs of flowing lines, it is true, but the principal reason for the modern monicker—Colonial coupe—lies in the use of windows made up of a number of small panes of glass. And the effect obtained by this means undoubtedly is colonial, for if larger panes be substituted for the small ones much of the effect is lost.

Naturally, a closed body, such as the coupe, permits the use of richer fittings—fittings that scarcely could be used on open cars. Seat cushions and the inside of the car can be upholstered in more delicate fabrics than can be used otherwise, and though the appeal of such sumptuous treatment may not be to mere man, few women can resist the genuine air of "daintiness" that can be, and generally is, obtained.

As has been stated before, there is no real reason why the coupe may not be just as much a summer car as a winter car. In nearly every case all the windows are arranged to drop into pockets, leaving the car as open as "all outside" on occasion. That they expect their coupes to be used in summer is evidenced by the action of some manufacturers in constructing the rear windows so that they cannot be

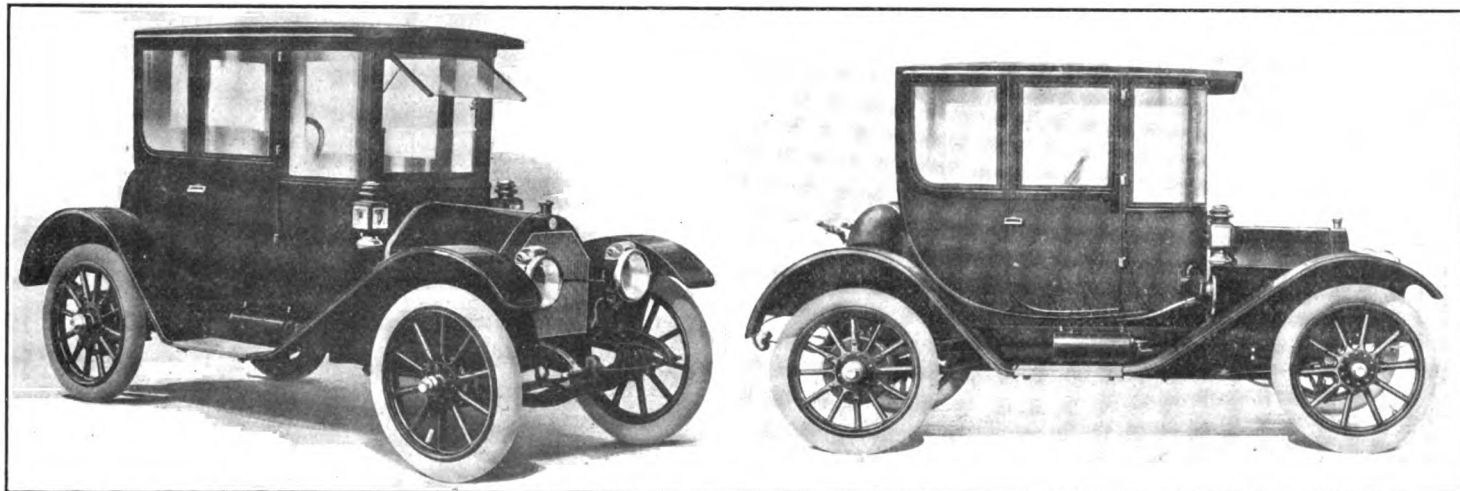
opened, the reason being to prevent dust and dirt that swirls up at the back from entering the body. Generally, the front glass is arranged to hinge upward and outward from the center so that in inclement weather the driver's view of the road is unobstructed, while at the same time the ingress of rain or snow is prevented.

As a general rule, the seating capacity of the average coupe is three persons. Two of them are accommodated on the driver's seat and the third on an auxiliary seat arranged to fold up out of the way when not in use. Left-hand drive is quite common, and is peculiarly applicable to the inside driven coupe by reason of the fact that it permits the occupants to alight on the sidewalk, as in the case of all the larger cities a provision in the laws requires cars to be drawn up right side to the curb.

That eventually, the inside driven coupe will be seen in much greater numbers, out on the road as well as in the city, is the expressed opinion of not a few who are sufficiently intimately connected with the motoring public to be able to feel its pulse and prognosticate with a degree of accuracy that is not to be gainsaid. Abroad, as well as in America, the increase in the popularity of the closed car for all year service has been remarked, and in England

where the operation of motor cars probably is hedged by greater formality than anywhere else, the increase even has been remarked by the law makers themselves who propose to enforce an old statute which precludes the use of cars in which the driver is wholly closed, the contention being that in such a position he is cut off in respect to hearing, at least, from other traffic.

Which, it is only fair to state, is largely fallacy. With a good modern car, enclosed though it be, the driver can hear outside sounds far better than the average driver of at least half of the horse vehicles that are used on the streets because the drivers of these are deafened by their own rattling contrivances. Similarly, here is no reason why enclosing the driver in glass should obscure his vision. Though it undoubtedly is harder to drive while looking through a glass front on a rainy day, it is not difficult to learn and reduces itself automatically to driving more slowly. There is one conclusion, however, that is dictated by experience, though not all manufacturers have "cottoned to it." It is that under no circumstances should curved glass be used in front as it tends to distort the objects seen through it. Even glass which slopes sideways to give a torpedo effect is undesirable for the same reason.



TWO TYPES OF CHALMERS COUPE

JUDGES DISAGREE ON "CHAUFFEUR"

Buffalo Court Refuses to Respect New York Ruling and Salesmen-Drivers Are Fined—Terry's Opinion.

Despite the decision of Magistrate Murphy, rendered in the Jefferson Market Court in New York City, and despite a carefully-constructed opinion drawn for the comfiture of the Automobile Dealers Association of New York, by Charles Thaddeus Terry, Esq., who played a large part in framing the Callen law, Judge Maul, of the Buffalo City Court, has declined to sustain the right of automobile salesmen and other trade employes to drive trade cars without securing a chauffeurs license.

In order to test the point, three Buffalo dealers brought about the arrest of three of their employes and the result of the tests was the same in each instance. Each of the employes was fined \$5. Since Judge Murphy rendered his decision in New York, the police have ceased making arrests, and as the matter now stands what is legal in New York is illegal in Buffalo. Mr. Terry's opinion which, of course, has no legal force, is as follows:

"The question is really the question, who is a 'chauffeur' under the definition contained in the statute? The provision of the statute is that the term 'chauffeur' shall mean any person operating or driving a motor vehicle as an employe or for hire. It is to be borne in mind that no one other than the 'chauffeur,' as so defined, is obliged to have an operating license. As so defined, the chauffeur is one who is paid wages or compensation for operating an automobile; it does not include one who is paid wages as a bookkeeper, or as a salesman, or as a mechanic, who, on some rare occasion, is induced to drop his regular employment, in order to drive a motor vehicle on some particular errand. Such a person is paid his wages or compensation for keeping books or for acting as mechanic, or for performing services as a salesman, and does not 'operate a motor vehicle for hire,' as the language of the statute is. In other words, the precise question is, What is the man paid for? If he is paid for operating a motor vehicle, he is a 'chauffeur,' and must be licensed. If he is hired and paid for doing something else, and operates an automobile only occasionally and as a matter of kindness or courtesy, or out of an obliging disposition for his employer, he does not require a chauffeur's license, because he does not come within the definition provided in the statute.

"As a matter of caution, it is to be observed that, if the wages or compensation of a man are in any respect or degree paid him for doing several things, one of which is driving of a motor vehicle, he would then

come within the definition of 'chauffeur,' because he would then be hired in part to drive the motor vehicle; but on the other hand, if the driving of the motor vehicle is outside the regular scope of his employment and he does it only casually, he does not come within the prohibition of the statute."

"Vaporizer" That Caught Canadian Money.

Up in Western Canada there are more than a few people who would not mind discovering and laying hands on the who's who of "The Hydro-Carbon Vaporizer, Ltd." Others there are who fondly imagine that some day the \$10 they paid for "Hydro-Carbon" stock will return to them in greatly increased wads. The latter are persons of great and simple faith; the others are wiser if sadder men.

"Hydro-Carbon Vaporizer, Ltd.," appeared in Winnipeg several weeks ago, rented desk room in a real estate office, sung an enticing song, and then sold a large amount of its capital stock at \$10 per share, and disappeared, all within ten days. It is said the wily ones took with them enough money to commence manufacturing operations in Fort William, Can., which was given as "Hydro-Carbon's" home address. The "wonderful vaporizer" of which they sung was a "revolutionary invention," in the shape of a new carburettor guaranteed to burn "gasolene, naphtha, petrol, kerosene and distillate perfectly in any type of internal combustion engine" to quote from the title page of the highly optimistic prospectus.

After the disappearance of the stock-sellers, some men of an investigating turn or mind learned that many statements made had small regard for scientific accuracy, and that the "revolutionary principle" was almost but not quite as ancient as the proverbial hills.

Michelin Gets Rebate on Imported Tubes.

The Treasury Department has announced that drawback allowance has been allowed under Section 25 of the Tariff Act, August 5, 1909, and regulations which were promulgated thereunder on June 16, 1911, on inner tubes for automobiles tires manufactured by the Michelin Tire Co., of Milltown, N. J., with the use of imported metric thread valves; the allowance not to exceed one imported valve for each inner tube exported.

Big Building in Boston For Ramblers.

A salesroom of unusual size is to be established on Commonwealth avenue, Boston, Mass., for the exclusive use of Rambler cars. The land has been purchased at a cost said to exceed \$100,000, and on this property a four-story fireproof building, 216 x 127 feet, will be erected. The structure will have over 60,000 square feet of floor space, and has been leased to the Thomas B. Jeffery Co. for a period of twelve years.

ENGINEERS NOMINATE DONALDSON

Named as Next President of S. A. E. and His Election Assured—The Other Nominees—Banquet Date Fixed.

Henry F. Donaldson, former editor of the Commercial Vehicle, will be the next president of the Society of Automobile Engineers. His name heads the slate presented by the nominating committee which is now being voted on, the result of which vote will be announced on the first day of the organization's annual meeting, January 18. As there are no opposing candidates, Donaldson's election is largely a matter of form. The other nominees who also will be inducted into office are: First vice-president—H. W. Alden, Timken-Detroit Axle Co.; second vice-president—Harold L. Pope, Pope Mfg. Co.; treasurer—Herman F. Cuntz, Automobile Board of Trade; members of the council—A. L. Riker, Locomobile Co. of America; Charles B. Whittelsey, Hartford Rubber Works; A. B. Cumber, Autocar Co., Henry Souther.

Under the terms of the Society's constitution, the president, as well as some of the other officers, cannot serve for more than one year, that is, they cannot be elected to succeed themselves. The officers who therefore will retire are as follows: Henry Souther, president; Henri G. Chatain, first vice-president; R. C. Carpenter, second vice-president; A. H. Whiting, treasurer. Members of the council—Herman F. Cuntz, W. G. Wall, H. F. Donaldson.

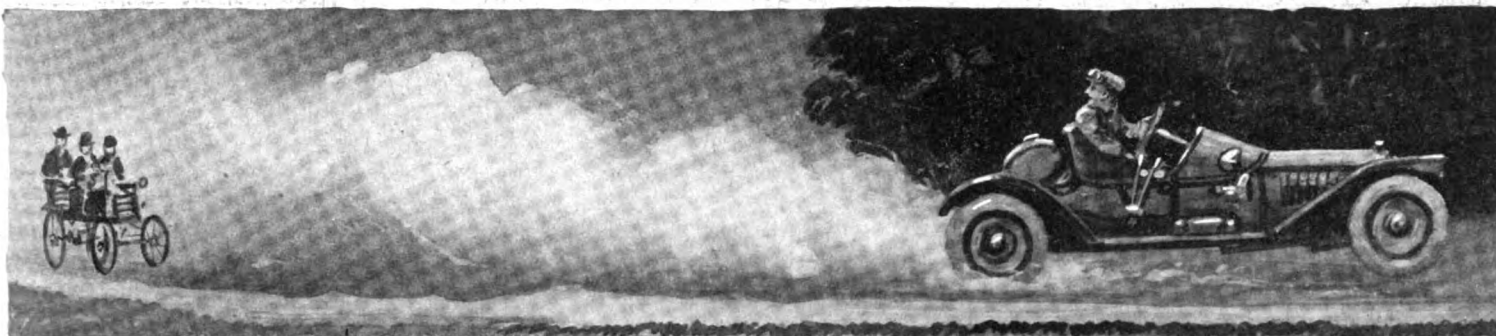
On the 19th, the day following the annual meeting, the society will hold its first, or at any rate, its most formal banquet. It will occur in the Belvedere room of Hotel Astor and probably will prove the largest function of the sort that will mark the New York show season. There are those who anticipate that fully 600 will attend. The committee in charge is H. M. Swetland, chairman; Hermann F. Cuntz, Thomas J. Fay, Howard E. Coffin, F. J. Newman, Coker F. Clarkson, secretary.

Takes Canadian Agency for Kissel.

E. Boyce, president and general manager of the Boyce Carriage Works of Winnipeg, Manitoba, has secured the Canadian agency for the Kissel Kar lines of cars and trucks. Boyce will establish a salesroom and garage in Winnipeg which will be managed by R. L. Husk, who has had ripe experience in business.

Winnipeg Company to Handle R. C. H.

The R. C. H. Motor Sales Co. has been organized in Winnipeg, Manitoba, to handle the R. C. H. car in western Canada. W. E. Roby, who formerly was manager of the Goodyear branch in Winnipeg, is vice-president and general manager of the new sales company.



Looking Back at the Shows of Yesteryear

When Diana comes off her perch on top of Madison Square Garden at the close of the Twelfth Annual Automobile Show on the 20th inst., it will mark the end of automobile shows—and all other shows—in the historic building—the structure which cradled the motor carriage thirteen years ago, and saw it become a mighty giant. Yes, thirteen years ago; for though it has been stated that automobiles were exhibited in Madison Square Garden in 1897, contemporaneous records fail to support the statement. It was not until two years later, January 21, 1899, that the first "horseless carriages" were shown to the gaze of a wondering crowd by three makers: the Pope Mfg. Co., of Hartford, Conn., which exhibited two electric pleasure cars, one electric delivery wagon and one gasoline parcel carrier; the Riker-Electric Motor Co., of Brooklyn, N. Y., which staged one phaeton, one delivery wagon and one tricycle, and the Iven-Brandenburg Co., of New York, which showed an Oakman gasoline pleasure carriage. These in combination with the Diamond Rubber Co., which showed a line of motor vehicle tires, were the pioneer exhibitors. They were displayed in connection with the "annual bicycle" show in New York, and attracted small attention, and excited no great comment.

It was not until the following year that the first exclusive automobile show occurred in this country. It was held November 3 to 10, 1900, under the auspices of the Automobile Club of America, in Madison Square Garden. During the nine months from January 1 to October 1, in that year, interest quickened enormously and motor vehicle companies sprang up like mushrooms in all directions; their aggregate capitalization reached the immense sum of \$329,500,000—but most of them were merely "paper" companies; few reached the stage of actually producing cars. It was in March, 1900, that the first show was held in Chicago also.

Thirty-three automobile manufacturers showed their wares at this first automobile

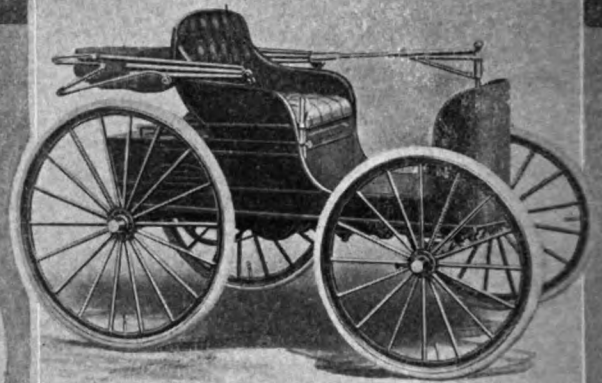
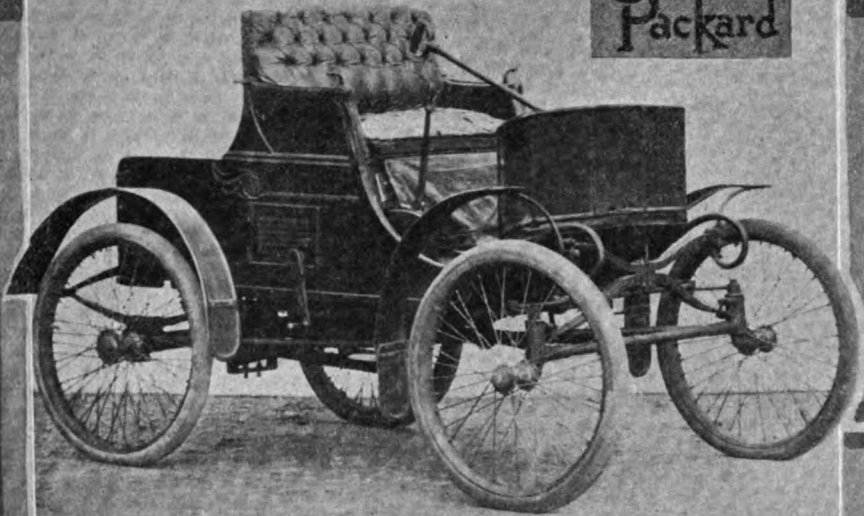
show at New York City, the honor roll including: American Bicycle Co., (the bicycle trust) New York City, (steam and gasoline cars and Waverly electrics); Automobile Co., of America, New York, (gasoline cars); Autocar Co., Ardmore, Pa., (gasoline vehicles); Baker Motor Vehicle Co., Cleveland, Ohio, (electrics); Sidney B. Bowman Cycle Co., New York City, (Kensington steamers); Buffalo Electric Carriage Co., Buffalo, N. Y., (electrics); Canda Mfg. Co., Carteret, N. J., (Canda gasoline quadricycle); Daimler Mfg. Co., Long Island City, N. Y. (gasoline delivery wagons); DeDion-Bouton Motorette Co., Brooklyn, N. Y., (gasoline cars); Duryea Motor Co., Reading, Pa., (three-cylinder gasoline cars); Electric Vehicle Co., Hartford, Conn., (Columbia electrics); Foster Automobile Mfg. Co., Rochester, N. Y., (Foster steam cars); Holyoke Automobile Co., Holyoke, Mass., (steam cars); International Motor Carriage Co., Stamford, Conn., (gasoline cars); Knox Automobile Co., Springfield, Mass., (gasoline tri-car); Locomobile Co. of America, New York City, (steam cars); Mobile Co. of America, Tarrytown-on-the-Hudson, (Mobile steamers); National Automobile & Electric Co., Indianapolis, Ind., (electrics); New York Motor Vehicle Co., New York City, (steam cars); Ohio Automobile Co., Warren, O., (Packard gasoline cars); Overman Automobile Co., Chicopee Falls, Mass., (steam cars); Peerless Mfg. Co., Cleveland, Ohio, (gasoline "motorette"); Riker Motor Vehicle Co., Elizabethport, N. J., (electrics); John T. Robinson & Co., Hyde Park, Mass., (gasoline cars); St. Louis Motor Carriage Co., St. Louis, Mo., (gasoline cars); Springfield Cornice Works, Springfield, Mass., (Meteor gasoline cars); Stanley Mfg. Co., Lawrence, Mass., (Stanley steamers); Steamobile Co., Keene, N. H., (steam runabouts); Steam Vehicle Co., Reading, Pa., (steam cars); Upton Machine Co., New York City, (gasoline cars); Waltham Mfg. Co., Waltham, Mass., (gasoline cars); Winton Motor Carriage Co., Cleveland, Ohio,

(gasoline cars); Woods Motor Vehicle Co., Chicago, Ill., (electrics).

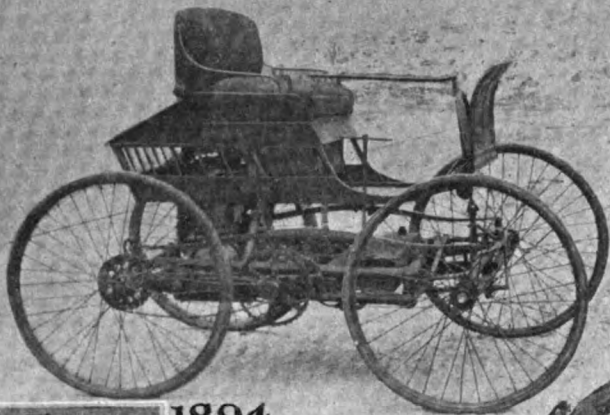
In addition to these exhibitors of complete cars, there were 24 accessory makers who showed their wares, the complete list being: Consolidated Rubber Tire Co., Akron, Ohio, (Kelly-Springfield tires); Diamond Rubber Co., Akron, Ohio, (Diamond pneumatic tires); B. F. Goodrich Co., Akron, Ohio, (Goodrich solid and pneumatic tires); Goodyear Tire & Rubber Co., Akron, Ohio, (Goodyear solid and pneumatic tires); Hartford Rubber Works, Hartford, Conn., (Hartford pneumatic and Turner solid tires); International Automobile & Vehicle Tire Co., New York City, (solid, sectional and pneumatic tires); New York Belting & Packing Co., New York, (New York semi-pneumatic tires); Munger Vehicle Tire Co., Brunswick, N. J., (Munger non-collapsible pneumatic tires); Bevin Brothers, East Hampton, Conn., (Bevin bells and gongs); Badger Brass Co., Kenosha, Wis., (Solar acetylene lamps); A. E. Brecher & Co., New York City, (Fleming gasoline motors); Joseph Dixon Crucible Co., Jersey City, N. J., (graphite lubricants); Dow Portable Electric Co., Boston, Mass., (ignition batteries); C. J. Dowling, New York City, (Baldwin chains and Rice steam engines); Gleason-Peters Air Pump Co., New York City, (pumps); Gray & Davis, Amesbury, Mass., (lamps); Janney, Steinmetz & Co., Philadelphia, Pa., (seamless steel plates); New Process Rawhide Co., Syracuse, N. Y., (rawhide pinions); Charles E. Miller & Co., New York City, (supplies of all kinds); Crest Mfg. Co., Cambridgeport, Mass., (air-cooled gasoline motors); Fleming Mfg. Co., New York City, (single-cylinder, air-cooled motors); Rose Mfg. Co., Philadelphia, Pa., (Neverout lamps); C. F. Splitdorf, New York City, (spark plugs and coils); Veeder Mfg. Co., Hartford, Conn., (odometers and bells).

During the next twelve months the automobile industry made wonderful strides, and when the second great show at Madi-

The
Original
Packard

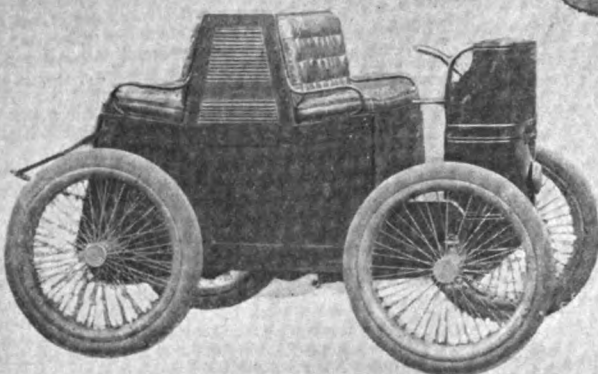
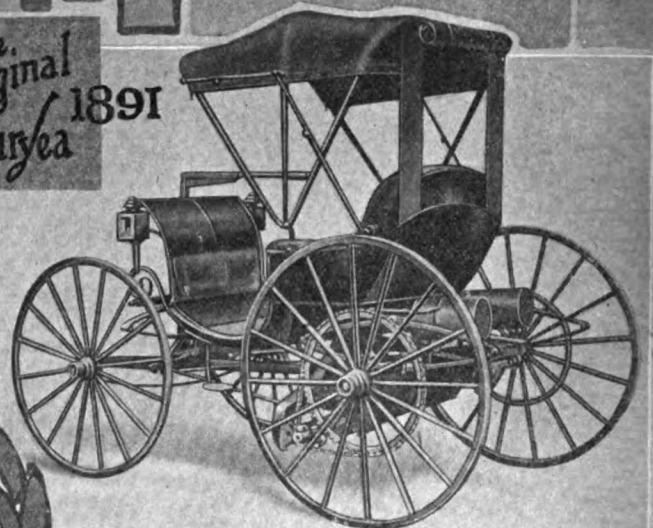


Duryeas Second Car - 1894

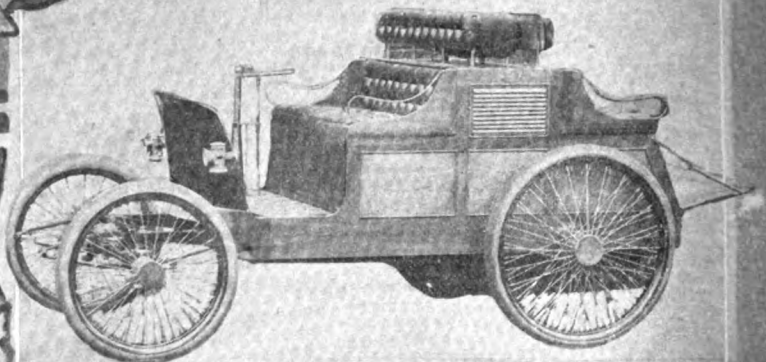


The
Original
Haynes
1894

The
Original
Duryea
1891



The
Original
Winton



The
Second
Winton

SOME OF THE PIONEER VEHICLES THAT BLAZED THE WAY



son Square Garden occurred, 41 manufacturers of self-propelled vehicles exhibited their wares, six of them confining their product to electrics, 14 pinning their faith to the steam carriage, while 21 took up the newest form of locomotion: the gasoline vehicle. At the same time the number of accessory exhibitors rose to 76, or more than quadruple the number in evidence at the first show.

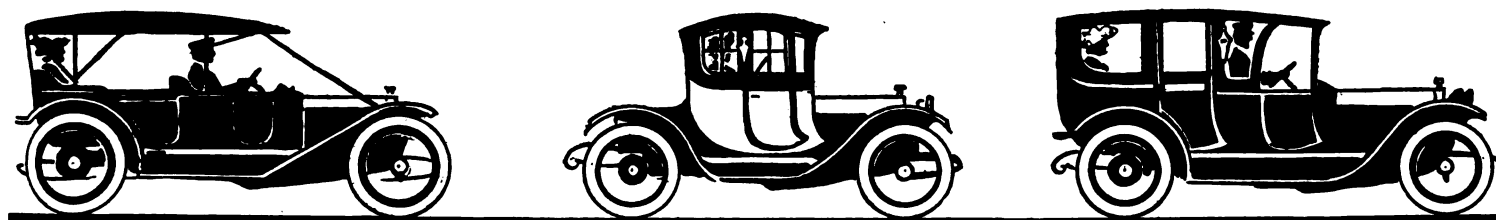
There was no show in 1902, and yet there was no lapse in the sequence of shows in Madison Square Garden. This somewhat mystifying and apparently paradoxical statement is explained by the fact that the season of the automobile show was shifted from November to January, the show which ought to have been staged in November, 1902, being postponed six weeks,

This small number was completely lost in the avalanche of gasoline cars, of which no less than 241 were on view, exhibited by 64 makers. Even the electrics were hard pressed, the number of individual makers remaining at seven, as in the previous year, while the number of cars exhibited dropped to 48. An oddity of this show was a combination gasoline-electric car, which was displayed in two forms, one designed for pleasure, and the other for business.

Heretofore the one- and two-cylinder cars had been in the majority, but when the doors of Madison Square Garden opened in January, 1905, the crowd was confronted with evidences of the sweeping victory of the four-cylinder car, which alone counted more representatives than all the other types together. Of the 177 gasoline cars

and found it—in a New York Armory. Thus it came to pass that when the doors of Madison Square Garden opened on the "licensed" show, an unlicensed one held the boards in the Armory. The two shows combined held no less than 389 gasoline cars, 31 electrics and 10 steam cars, the latter being staged exclusively in the Armory, their makers, of course, not being concerned with Selden and his patent. Of the gasoline cars, 274 were fitted with four cylinders, 51 had two cylinders, 10 had one cylinder, six rose to the height of being propelled by a sextet of pistons, five utilized the power of three cylinders, while one—a veritable freak motor—boasted of five rotating cylinders.

The split between the rival factions became more pronounced in the following



or until the second week in January, 1903. This show—the "Third" in the chronological list of automobile shows—witnessed the beginning of the end of the steam carriage. While at the 1901 show 14 makers had exhibited steam cars, their number dropped to 12 in January, 1903, with a total of 34 cars; at the same time the number of makers of electrics rose to seven (showing 51 cars), and that of the gasoline adherents to 60, who staged no less than 168 complete cars and chassis.

When the great automobile event of 1904 rolled around and a count was taken of those present, it was discovered that the steam carriage was dying, and dying fast, while the gasoline motor pursued its victorious march, threatening to crowd everything else off the boards. Only three makers held fast to the "road locomotive," they displayed nine examples of their work.

exhibited, 96 were of the four-cylinder variety, 50 boasted two cylinders, 25 employed one cylinder, five utilized three cylinders, while two were so "extravagant" as to fit their cars with six cylinders. Electric vehicles dropped another few points behind their rivals, being represented by 31 cars, shown by six makers. Steam carriages were hard to find, but diligent search disclosed four clustered on the space of a single exhibitor.

While previous to 1905, everything had been "milk and honey" in the camps of rival manufacturers, that year witnessed the cleavage caused by the Selden patent and its accompanying events. The Association of Licensed Automobile Manufacturers was formed and the Garden Show became "forbidden ground" to those who would not bow to the famous patent. So they went to seek for another show place

year, 1907, when the old Grand Central Palace was chosen by the "unlicensed" makers, in which to display their wares. The "Selden crowd," of course, remained in Madison Square Garden, and opened its show a week later than their opponents. Together they numbered 353 complete gasoline cars, and 86 gasoline chassis, 40 electrics and nine steam vehicles. Of the gasoline cars (including chassis) 368 had four cylinders, 35 had two, 19 had six, nine cars had three, six got along with one cylinder, while two cars were fitted with the then unheard-of number of eight cylinders. In regard to body construction popular preference was fairly well distributed between open and closed cars, there being on view 78 runabouts, racing cars and roadsters, 154 touring cars, and 92 closed cars, the latter including all limousines, landaulets, coupes and town cars.



Exactly as the year 1902 had been lost in automobile show history, on account of the shifting of the date from October to January, the year 1908 disappeared for the same reason, but the figures 1907 are enblazoned twice in the records, the so-called 1908 show being advanced to October, 1907. A strenuous propaganda for "early shows" had been carried on during the year, and when the fall season rolled around, both camps prepared for simultaneous exhibits in the Garden and the Palace. The early show did not prove very popular, however, for there was a decided falling off in exhibitors, in number of cars exhibited and in the records of attendance. Only 284 complete gasoline cars and 61 gasoline chassis were shown, two of them having eight cylinders, 47 being fitted with six, 248 with four, four with three, 38 with two, and six with one cylinder. Forty-four electric carriages and seven steam vehicles made a brave show on their own account, the electrics, with the exception of three cars, being assembled in the Palace, where they were congregated in one section of the exhibition space. In bodywork a slight shift was evident, the number of roadsters having increased to 119, that of touring cars decreased to 138, while closed cars to the number of 75 were shown.

Fourteen months of improvement and feverish activity intervening between the closing of the 1907 "October" show, and the opening of the 1909 show season—for the "early show slogan" had not been very successful and the makers had returned to January dates—showed their effects when the public was permitted to view the offerings of 1909. At this—the Ninth—show season the steam vehicle made its last stand with nine representatives, six being shown in the Garden and three in the Palace; more tenacious against the attacks of the gasoline car, the electrics mustered 34 representatives, as against the host of 317 carrying the gospel of gasoline. At these two shows there were neither eight-, nor five-cylinder cars, the 317 complete cars and 77 chassis including 50 sixes, 275 fours, three threes, 42 twos and 13 singles; in addition there were six two-cycle representatives, equally divided between four, three, and two cylinders. In bodywork the temporary "craze" for the roadster of the racing type was the cause of 151 cars of this type being exhibited, while 109 touring cars and 100 closed cars made up the remainder of the 360 complete vehicles shown.

The Tenth Annual Automobile Show, when it opened its doors in January, 1910, witnessed the practical elimination of the steam carriage, only a single vehicle of that type being exhibited, as a side issue by a successful maker of gasoline vehicles. Grand Central Palace, too, was almost exclusively "gasoline"—only two electric cars furnishing variety to the otherwise unbroken line of gasoline vehicles. Together the two exhibitions showed 327 gasoline cars, 35 electrics and one steamer. Sixty-

two of the gasoline cars and chassis were sixes, 326 were fours, 11 were twos, and five were singles. Three four-cylinder two-cycle and two three-cylinder two-cycle cars were shown at the Palace. In the matter of body-building this year witnessed a sudden drop of the popularity of the roadster and a return to the comforts of the roomy touring car and the beginning of the "torpedo" body. Eighty-six runabouts, 179 touring cars and 128 closed cars were shown in addition to 81 chassis.

The following year, 1911, saw the inauguration of two-weeks shows, the second week being devoted to commercial vehicles, with which were mixed a score of electric pleasure cars. Thus practically left to themselves—for the single steam car of 1910 was still "alive and kicking"—the gasoline cars made a more powerful showing than ever. No less than 362 separate and distinct complete cars of this style were shown, establishing a high record. According to cylinders they were divided into 56 sixes, 40 fours, nine twos and six singles, while 13 four-cylinder two-cycle, and two two-cylinder two-cycle cars represented the two-cycle idea of motor construction. In bodywork, the "torpedo" swept the boards, driving both the open touring car and roadster to flight. Only 75 runabouts, more than half of them fitted with doors, were exhibited, while 237 touring cars and 61 closed cars made up the remainder of the complete cars shown. In addition to the complete cars, no less than 74 chassis were on view.

No account has been taken in these statistics of the Chicago shows, in which practically the same makers exhibited as in the New York exhibitions, with the exception of a small number of Western manufacturers, whose products do not materially affect the census.

The first exclusive display of commercial vehicles was made in Chicago in 1907, but it was a lonesome, almost funereal show, and so few attended that it was not repeated until last year.

During the first week of the 1911 show, the decision adverse to the Selden patent was announced, and the words "licensed" and "independent" lost their meaning. While at the forthcoming shows the members of the Board of Trade will exhibit at the Garden and non-members at the Palace, there is no enmity among the rival manufacturers—nothing but good-natured rivalry and competitorship—as in other business pursuits.

Chicago Motorists to Sign Own Bonds.

Following the agitation of the Chicago Automobile Club, the chief of the Chicago police has issued an order permitting all drivers of automobiles and motor trucks to sign their own bail bonds of \$400 or less, if such a person is arrested for violation of any of the municipal or park ordinances, or violation of the State law, where no bodily injury has resulted to anyone on

account of the violation. The judges of the municipal courts have acquiesced in the order.

"National Association" Chartered in Canada.

After repeated efforts, Canada may or may not be in a fair way of having a national automobile association of its own. At any rate, what is styled Canadian National Automobile Association has secured a Dominion charter, but exactly who compose the membership and what is the working plan has not been made plain, the only names on the letterheads being those of W. J. Ross, secretary; A. J. Mumford, treasurer, and R. M. Jaffray, manager of an automobile show which the new association is preparing to hold in the St. Lawrence Arena, Toronto, February 21 to 28.

W. J. Ross is a member of the Ross Motor Car Co., of Toronto, while Jaffray is well known as a former publisher and a promoter of shows. The show which will be the first active work of the new association, will be a sort of "independent" affair, staged for the benefit of a number of intending exhibitors who were crowded out of the "regular" show, which will be held in the Toronto Armory under the auspices of the Ontario Motor League. It is also stated that disputes arose in regard to the price of admission and space rent, and this was the chief cause of the formation of the new "association."

Motor League Formed in Saskatchewan.

The Saskatchewan Motor League has been organized in the Canadian province of that name by the automobile clubs of Moose Jaw, Saskatoon, Indian Head and Regina. Its officers are as follows: President, Richard Loney, Moose Jaw; first vice-president, L. G. Calder, Saskatoon; second vice-president, Sheriff Cook, Regina; third vice-president, Eli Williamson, Indian Head; secretary-treasurer, H. V. Bigelow, Regina; executive committee, the officers and W. H. Coy, Saskatoon; J. C. Coe, Moose Jaw, and Andrew Dickson, Indian Head.

Why Iowa Will Send Tags by Mail.

Declaring that the express companies are charging too much for delivery of automobile license plates, W. C. Hayward, secretary of the State of Iowa, intends hereafter to use Uncle Sam's mail service instead. A pair of the plates weighs fifteen ounces and the express companies refused to transport them for less than fifteen cents a pair, which just equals the postal rate.

Automobile Accident Called "Trespass."

Suit for \$3,000 in an action for "trespass" has been filed by Nathan Rosenblum against Peter J. McClure of Bristol, Conn., in the Providence, (R. I.), courts. In his complaint Rosenblum charges that an automobile belonging to McClure struck a wagon belonging to him and wrecked it.

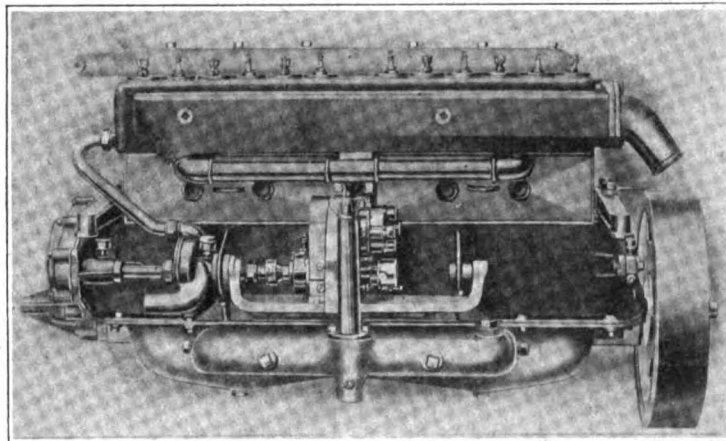
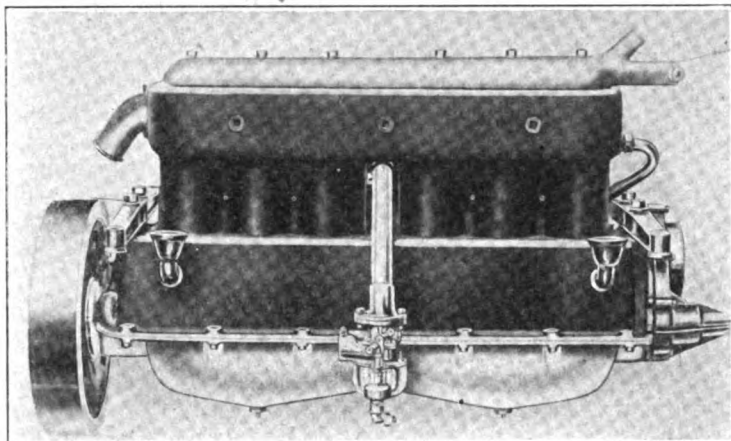
Trends of the Trade; the Advance of the "Six"

One of the easily observable tendencies of the trade is the inclination toward six-cylinder cars, and though the enhanced cost of production and the necessarily higher selling cost doubtless has a limiting influence on the inclination, more "sixes" are in evidence than ever before. The six-cyl-

have attained favor earlier had it not been for the difficulties that attended the construction and, in even greater degree, the operation of these motors in the younger days of the industry, when there was little information and experience available. One of the most serious difficulties was that of

retter, and this evil was of course greatly aggravated by temperature changes—unpleasant enough, six or seven years ago, even with four-cylinder motors.

Those who can remember how the old-fashioned ignition systems worked—or refused to work—can appreciate what it must

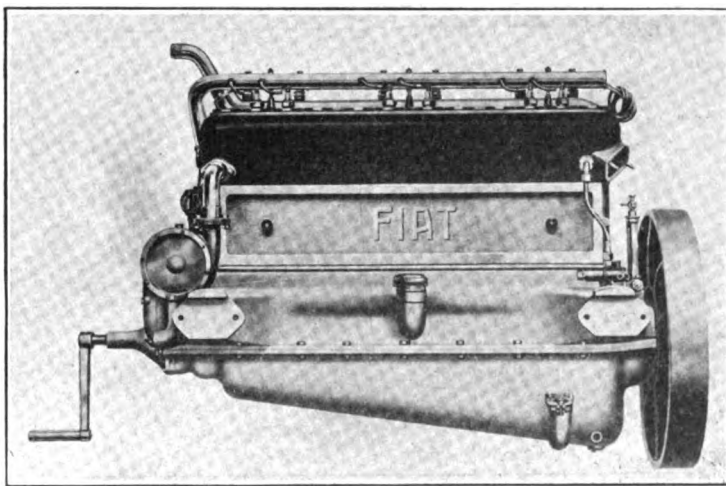
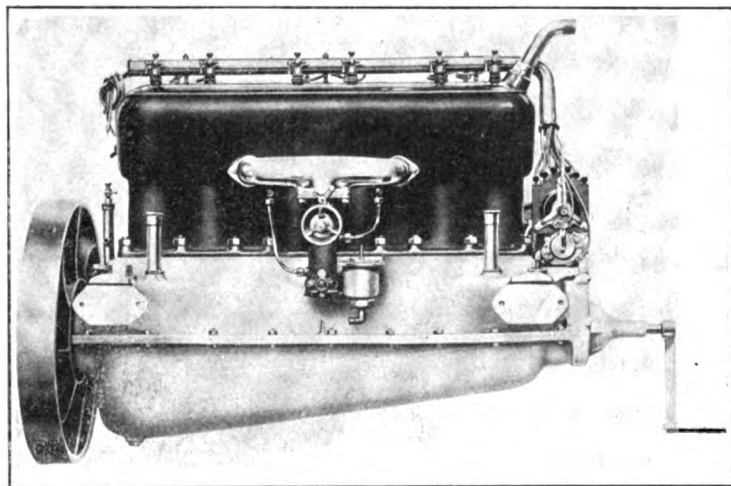


SPLENDID EXAMPLE OF BLOCK CASTING—THE EVERITT "SIX"

inder car generally is reckoned the ultimate development of the reciprocating type of internal combustion motor, and with reason, but the fact often is overlooked that no little work has been done in the development of motors having other numbers of

securing a proper distribution of gas to the cylinders from the carburetter, owing to the greatly increased distance it was necessary for the gases to travel and the widely varying distances from carburetter to cylinders. The carburetter is, of course,

have meant to keep the ignition working properly for six cylinders when it was hard enough, often, to do it with four—or even one, for that matter. It is difficult to say which occasioned the most trouble for the six-cylinder pioneers, the ignition or the



ANOTHER FINE SPECIMEN OF THE BLOCK TYPE—THE FIAT "SIX"

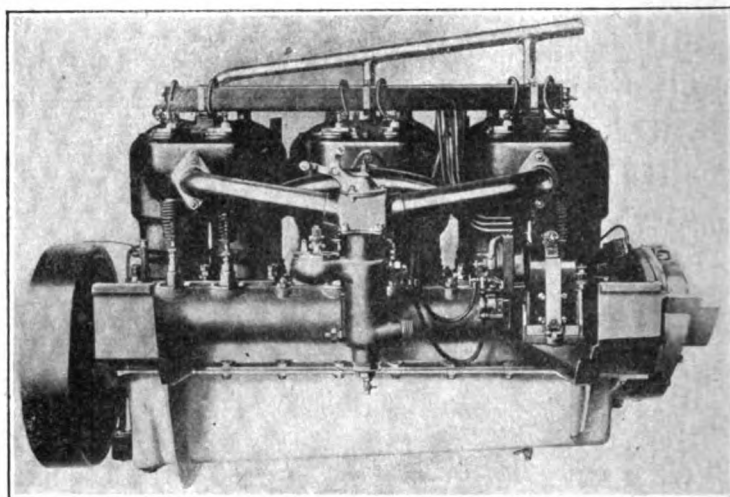
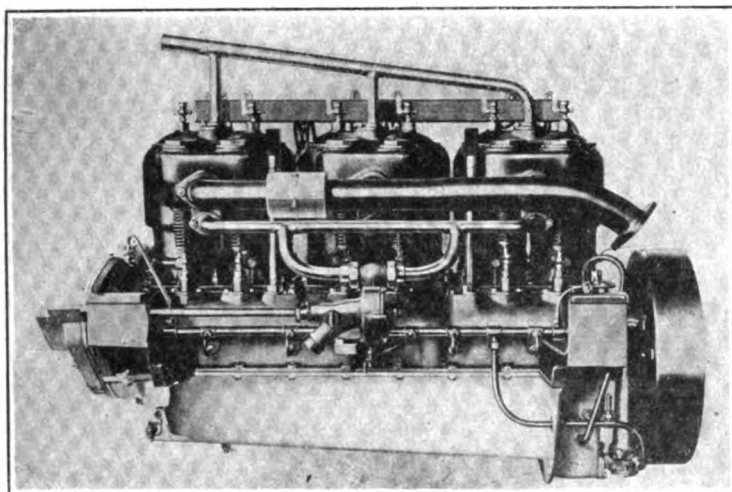
cylinders. Since the Madison Square Garden show of 1905, when the six-cylinder type was represented, for the first time, by two motors, there have been various makes of one, two, three, four, five, six and eight-cylinder engines shown in the old building—every number from one to eight except seven. Of all these the "four" and the "six" are substantially all that remain.

There is little doubt that the "six" would

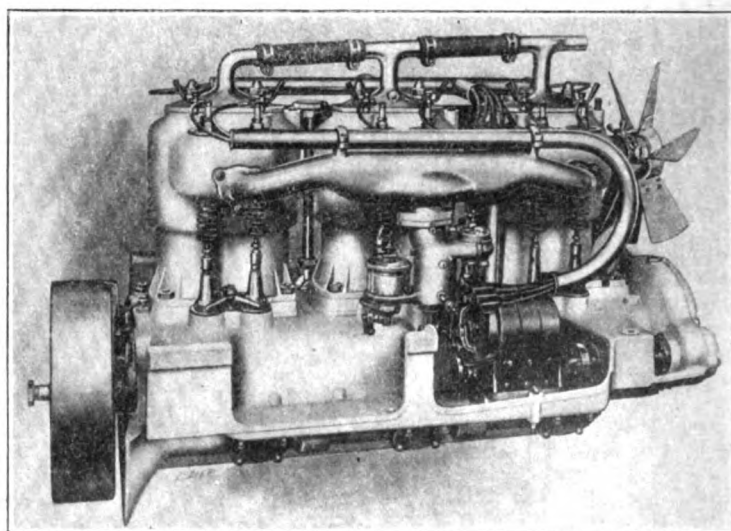
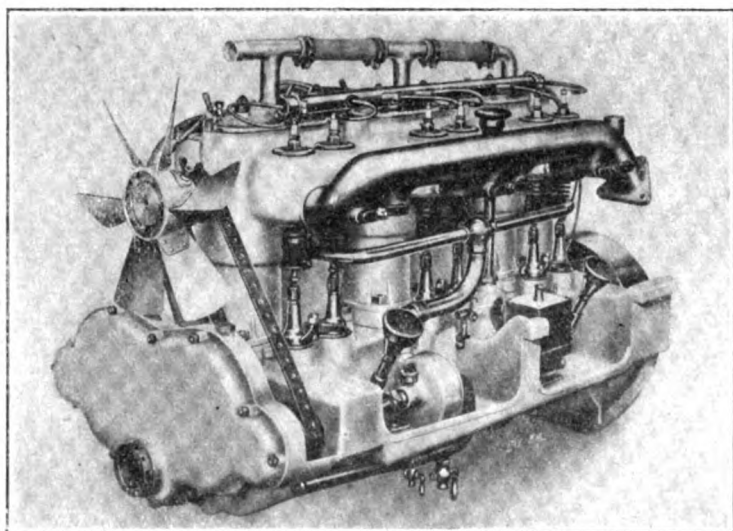
more severely taxed, and the conditions are somewhat different from those existing in a four-cylinder motor. It early was found that the cylinders furthest from the carburetter frequently could not be induced to fire at all, or only spasmodically, or that all cylinders would take turns in missing. The gasoline vapor often would condense in the long intake pipes, upsetting all the best laid plans as to adjustment of the carbu-

carburetter, but between the two the progress of an old-time six-cylinder car was often punctuated by a succession of missed explosions and the constant "hitching" that the driver of a car hates so cordially. Success came, however, with the improvement of carburetters, the refinement of ignition apparatus and the better understanding of the engineering problems that beset the six-cylinder engine.

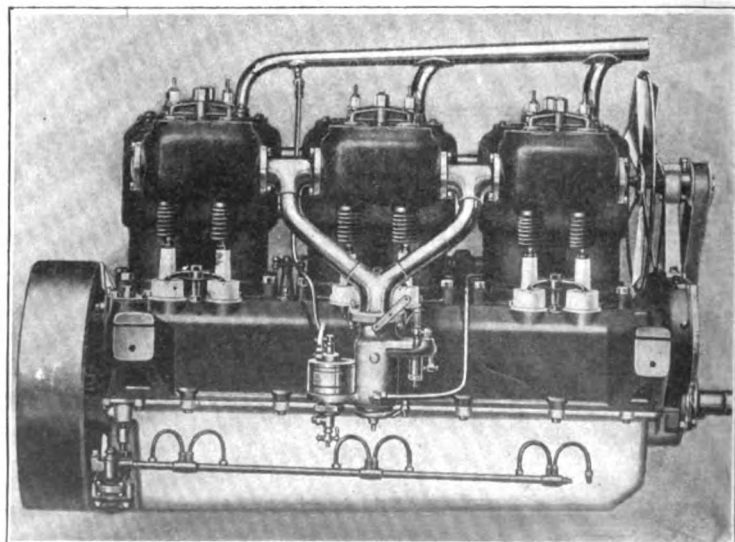
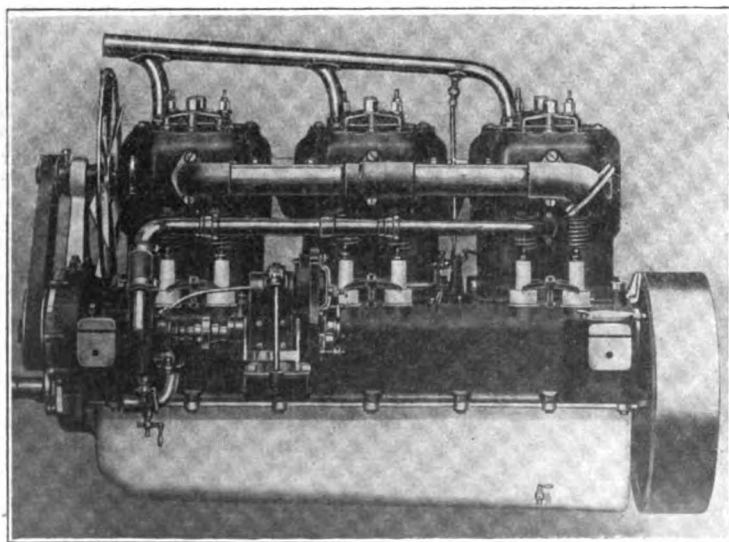
CHARACTERISTIC TYPES OF SIX-CYLINDER ENGINES, CAST IN PAIRS



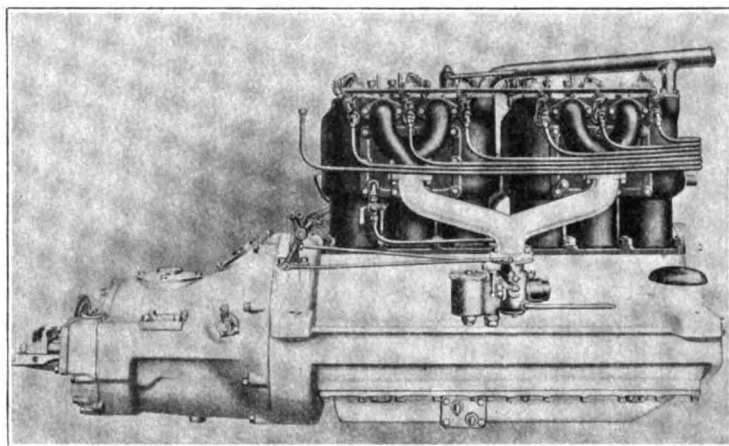
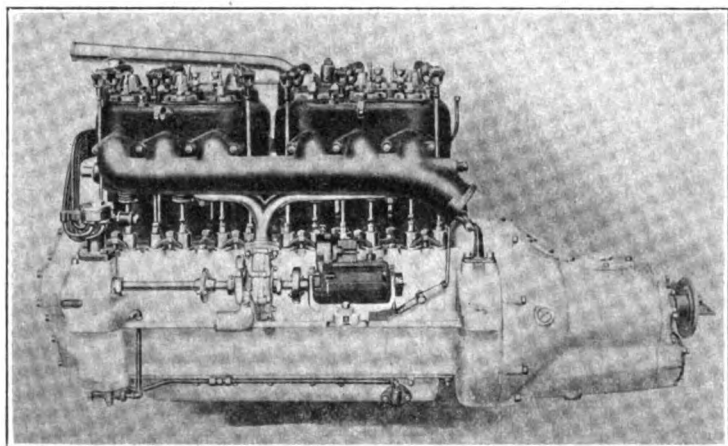
INTAKE AND EXHAUST SIDES OF THE LOCOMOBILE



EXHAUST AND INTAKE SIDES OF THE LOZIER



EXHAUST AND INTAKE SIDES OF THE PREMIER



CYLINDERS CAST IN THREES—THE CHALMERS: EXHAUST AND INTAKE SIDES

The electric motor is probably as near to the ideal power producer as anything human ingenuity will ever produce, because of its constant and steady pull—"constant torque," to be scientifically correct. This means that the force tending to keep the shaft rotating is not intermittent, but is constantly applied, so that there is no tendency to "jerk" and cause vibration. The nearer a gasoline motor can approximate to the steadiness of motion of the electric motor, the more smoothly it will run and, of course, the more comfortably the vehicle which it propels will ride. The electric motor has, practically, a very large number of comparatively feeble impulses every revolution, the impulses making up in number what they lack in individual strength. The six-cylinder motor is worked out on analogous lines. By increasing the number of cylinders to what is considered the largest practical number, the crankshaft is given the greatest possible number of impulses per revolution, and smooth action is the result. In addition to "torque constancy" the six-cylinder motor has the further advantage that, for a given power output, the cylinders do not require to be as large as those of a motor having a smaller number, and consequently the individual impulses are lighter, with a corresponding decrease in the strains imparted to the working parts. A direct result of this is that the

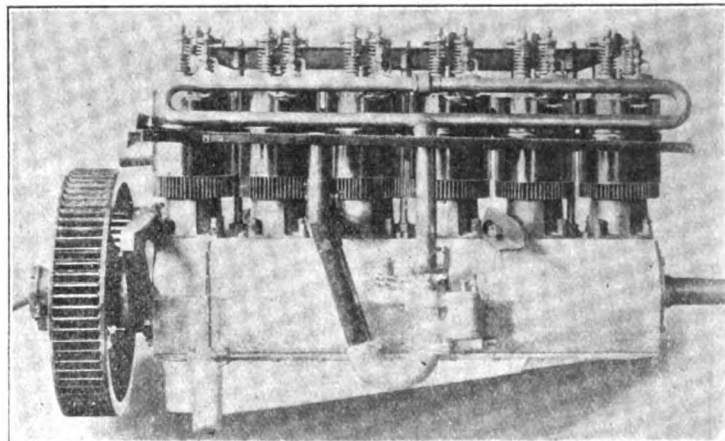
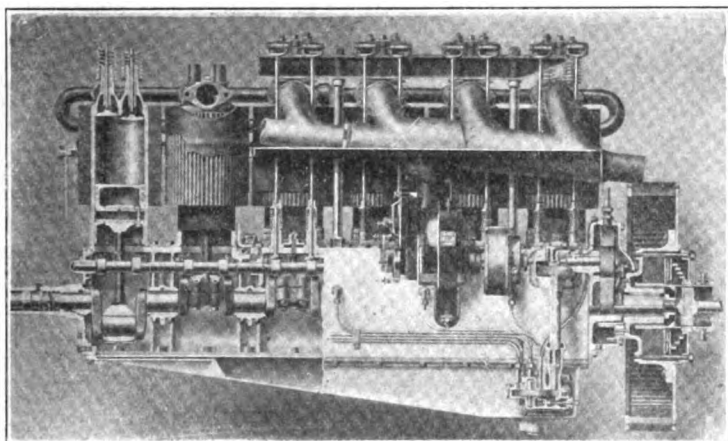
working parts can be made light, and this, together with the perfect mechanical balance that is obtainable, tends still further to make the motor the steady running prime mover that it is.

The six-cylinder car has other advantages besides mere smoothness of running and luxury of motion. The steady pull at the crankshaft—the constancy of torque—means that there are practically no parts of the revolution in which power is not being applied. In other words, there are no power-less stretches that must be filled in by the momentum of the flywheel. One result of this is that the six-cylinder can be throttled down so as to run considerably slower than a motor with a smaller number of cylinders, and a "six" can be made to run at an extremely low rate of speed on the high gear. While running at very low speed on the high gear is not usually considered a desirable practice, it is very convenient to be able to do so at times, for instance in heavy traffic where it may be necessary to speed up with the least possible delay. Again, the "six" pulls well at speeds that would cause the four-cylinder motor to stall, and for this reason is an excellent hill-climber. While it undoubtedly uses more oil and gasoline, there would seem to be some foundation for the belief that six-cylinder cars are more economical in the matter of wear of the rear

tires, other things being equal, than four-cylinder cars. This, however, is difficult either to prove or disprove largely because the wear on the tires is affected by so many other things—such, for instance, as the use of the brakes and the condition of the clutch.

Constructional methods in six-cylinder motors follow closely those of fours, even to the extent of casting all the cylinders in a single block. It speaks well for the reliability of oiling and cooling systems, that manufacturers and users are willing to adopt an engine in which the serious damaging of one cylinder means the replacement of the entire six; but the block casting system has worked very well with the "fours" and there seems no reason why it should not be equally successful in "sixes." The more common practice, however, is to cast cylinders either in pairs or in threes, the former method predominating. Individually cast cylinders are far less popular than they were a few years ago.

Whatever may be the changes in detail—whether the valves will be poppets, sleeves or rotors, or some other yet-to-come design—it seems probable that the six-cylinder motor will remain the highest development of the gasoline motor until the time comes—if ever it does—when the reciprocating gasoline motor shall be displaced by the internal combustion turbine.



INDIVIDUALLY CAST CYLINDERS—THE FRANKLIN: EXHAUST AND INTAKE SIDES

REPUBLIC WINS NOBBYTREAD SUIT

(Continued from Page 138)

plying ordinary skill the patentee simply changed their appearance and dimensions slightly to strengthen them so as to adopt them to the use of the automobile.

It must be conceded that in view of the prior art the claim in suit is not broad and any rights to equivalence are correspondingly meager, but nevertheless, I think the alterations made in the studs are not without patentable merit. In strengthening them and imparting to them distinctive characteristics and the advantages derived from their use as is evidenced by popular approval, by the large sales, and by their displacement of other tires and devices used for similar purposes. This is an important factor bearing upon the question of patentability. *Krementz v. Cottle Co.*, 148 U. S., 556.

This is a case in which it is not easy to decide that the patent in litigation is involved or anticipated by the antecedent art, although utility is not an absolute test of validity (*McClain v. Ortmyer*, 141 U. S., 419) it must, nevertheless, be considered in this case in the detriment of that question. The sudden danger from side skidding of large automobiles on wet or muddy roads was something to be feared and dreaded. Dealers in automobile tires made early and repeated efforts to minimize this evil. Their efforts in this direction have continued for more than ten years and are yet unabated. It has been shown that there have been many automobile dealers in recent years prior to the patent in suit to adapt bicycle tires having anti-skid studs or corrugations on their surfaces to automobiles for the purpose of reducing the tendency to skid; and that such efforts failed to achieve desired success. In testifying to the merits a number of witnesses have sworn that the Mell tire in suit is more efficient in preventing skidding on different kinds of mud and dry pavements, and roads, than any other tire known to the trade; that experience with former kinds and styles of anti-skidding tires has demonstrated that they are only efficient for a few hundred miles, while the efficiency of the Mell tire extends to a run of 2,500 or 3,000 miles.

To anticipate the patent the defendant particularly relies upon the expired Healey British patent number 20,544 and the United States Bailey, number 588,724, dated August 24th, 1897, for bicycle tires.

The Healey tire concededly has never been used as an automobile tire, save that the witness Mell tested and used it experimentally before he conceived his invention. There is a resemblance between it and the complainant's, but the differences in the configuration of the studs on the periphery and the tire, though slight, are substantial. In the Healey structure there are three rows of elongated studs or ridges on the surface of the tire arranged longitudinally, each row breaking joint—as in the complainant's tire—with those of the adjacent row. All of these studs are of the same form and dimensions, but instead of being rectangular and flattened at the top as are the complainant's, they are rounded with pointed ends. The distinguishing feature, though few, are, I think, clearly defined.

Prior to the present invention, the inventor made a rubber tire to correspond to the Healey drawing and specification and enlarged it for use on an automobile. The proofs show that the tread proved unsatisfactory as an anti-skidding tire in that the studs over a run of 200 miles had an eroded and warped appearance, indicating

that they retained little resistance to side skids. He then designed the elongated studs specified in the claim in controversy. In the Bailey patent is described a series of frusto conical teeth located on the surface of the tire "the bases of which are preferably tangent to each other." The teeth are made to "flatten and bend freely latitudinally," under the weight of the bicycle and rider.

It is defendant's contention that the Bailey tread as descriptive in the specification and as adapted to the automobile has the essential feature of the Mell invention, and accordingly anticipates it. But I do not think so. It is true that Bailey studs or teeth at their tops are flattened and a trifle elliptical, and the side walls taper to enlarge the base; yet they have not the elongation with rounded ends of complainant's studs and without that they are unable to get the necessary grip on the road or pavement to reduce the skidding movement of the automobile. The gripping capacity of the studs was the desideratum of complainant's invention, and this characteristic is absent in the Healey and Bailey patents. Other antecedent patents in evidence claimed to anticipate have been examined by me, but it is not believed that they have any material relevancy. In the main their tread surfaces were insufficient to prevent side skidding because the studs and protuberances possessed straight side walls and the edges were angular instead of divergent and rounded. It is true that the wide departure in the configuration of the studs from prior art has not been made and the solution by the patentee of the problem before him perhaps was not fraught with the greatest difficulty, but, nevertheless, that improvement was made by the exercise of the inventive faculty in this case is satisfactorily proven. That some of the elements of claim one are old and found in one or more prior rubber tires is unimportant in view of the fact that such elements have never before been assembled in the same way and caused to react so as to produce a useful result. The objection by the defendant that the patentee aggregated old elements is without force, as in their contention he caused them to perform something more than their special function—he combined such elements to perform a new, useful and valuable result.

The defendant contends that if there is a patentable feature it resides in the method by which the base of the studs is widened and in the fillet, which co-operate to prevent elasticity of the studs, and as such features are all specifically included in the claim they cannot be added thereto. It is true, nevertheless, that the patentee must be bound by the terms of his claim and can claim nothing which is not fairly impressed in its language. But such features are part of this specification and are thought to be mere details contributing to the manner in which the base is enlarged and the studs strengthened. Aside from this the combination of elements specified in the claim is described in the invention and, of course, it was unnecessary to include the structural details. But to read the fillet into the claim if it were necessary to do so to save the patent from invalidity would not, it is thought, do violence to the patent law, although it would be different if the purpose were to read something into the claim not contained therein by reasonable construction to avoid anticipation or escape infringement. (*Sub. Construction Co. v. Netcher*, 167 Federal Rep. 549.)

The defendant also contends that to elongate the studs on the tire, to round the ends and taper the walls, were obvious

things to do, and do not involve the exercise of the inventive thought, but, as heretofore indicated, I am convinced to the contrary. The great weight and speed of the automobile prevented using the anti-skid tires which had been especially designed for bicycles and ordinary vehicles. The problem presented to dealers in tires for automobiles was not one which the manufacturer of bicycle tires, with the prior art before him, could have solved; and the alterations and improvements made by Mell were due to his inventive skill. The defendant further contends that its tire is essentially different from complainant's, and that no confusion as between the two results to the trade. To the eye, it is true, the tires look different; nevertheless, the studded treads of complainant's tires are duplicated by the defendant whose studs are alike in appearance, style and dimensions. They are arranged in rows around the outer surface of the tire and are longer than their width, and rounded at the ends, with the tops flattened and their sides tapered, with enlarged base. They are arranged obliquely, differing in that respect from complainant's; but, as in complainant's, they extend in the direction of their length around the periphery of their tires and, by such use and configuration, substantially the same result is achieved. The oblique arrangement, though perhaps more efficient, does not void the claim. (*Marsh v. Seymour*, 97 U. S., 348; *American Crayon Co. v. Sexton*, 139 Fed. Rep. 564; *Hoyt v. Horne*, 145 U. S. 302. Nor is it void, by the use of a treaty like that in the Heine-mann British patent number 2,260, as such use also embodies the specific use of the claim which is the subject of the controversy. *Western Tel. Co. v. American Tel. Co.*, 131 Fed. Rep. 75.)

Such being the conclusion reached, it follows that claim one of the patent in suit is valid and infringed by the defendant. Complainant may have a decree for an injunction and an accounting but without costs.

How to Clean Driving Chains.

When unprotected chains become clogged by mud, dust and grime, the addition of oil as a lubricant merely serves to aid the grit make use of its abrasive properties. The proper way to lubricate an unprotected chain is to remove it, coiling it up upon itself, and place it in kerosene for 24 hours. When the greater part of the dirt has been cut by this treatment, scrub the chain well with a stiff bristle brush and rewash in clean oil. Thoroughly dry it and place in a pan of melted vaseline or wax to which has been added a couple of ounces of flaked graphite. Keep the vaseline warm until it has thoroughly impregnated the chain, then allow it to solidify with the chain in it. When cold remove the chain and wipe off the superfluous vaseline. This is a dirty job but it does not have to be done very often, and when the "sweetness" or running is taken into consideration, it will be found that the trouble is well worth while.

When a Magnet Will Prove Useful.

An iron or steel part that has found its way into a cylinder or crankcase or other inaccessible place often can be removed by the use of a fairly strong horseshoe magnet, lowered by a piece of string or pushed in on a stick.

Extending Export Trade; the Methods Worth While

This consular district is not only the home of three important automobile industries, but is a favorite touring region because of the picturesque scenery of Thuringia and its hundreds of miles of splendid roads; therefore one has a good opportunity here to observe the progress in German automobile manufacture and to compare the product, under practical operating conditions, with the machines of American tourists seen in the district, says Ralph Busser, American consul at Erfurt, Germany, in what is the most complete and most comprehensive report that has dealt with the subject, as follows:

At present the demand for self-propelled vehicles in Germany is almost entirely supplied by the home industry, which has made great progress during the past decade, gradually supplanting the French machines that formerly had the cream of the trade. The American manufacturers must realize that at present they are at a disadvantage in that fully a score of German firms who turn out good, serviceable cars at reasonable prices, have already established a reputation and trade in certain types of machines, are familiar with the conditions that have to be met to get business, advertise widely, and, in the case of large output, have in addition well-equipped stock rooms and selling agencies in many of the cities.

The first question to be considered by the American manufacturer in connection with the export trade is whether the extent and trade possibilities of a particular foreign market are such as to warrant the expense of introducing their machines and gaining a foothold there. The class of people financially able to own automobiles is much more limited in Germany than in the United States. Here the people of substantial means are chiefly high government officials, the landed proprietors, capitalists, bankers, prosperous professional men, big merchants, manufacturers, and others who are proprietors of important businesses. Business managers and others working in a subordinate capacity are not, as a general rule, nearly so well paid as in the United States where high-salaried employes constitute a fair proportion of those who can afford automobiles. The use of automobiles by physicians is not near so much the custom here as in the United States.

In view of the considerations mentioned, the German market for touring or outing motor cars is restricted to a comparatively small class of people; and this trade has certainly not been neglected by the German automobile makers, who are progres-

sive in the art of business getting as well as in manufacture. The demand for both high-grade and cheap machines seems to be fairly well supplied by the domestic industries. The growing popularity of automobiles and their increased use in a business way has created more demand for cheap than for high-grade machines. A cheap German make of the 4-cylinder phaeton type, 12 to 14 horsepower, seating two persons, can be purchased here for about \$900; seating about four persons, \$935. This car is upholstered in imitation leather, and the prices quoted do not include top cover, glass windshield, lamps and minor attachments. A 2-cylinder car of the same make, 6 to 7 horsepower, likewise upholstered, sells for about \$625; and a 1 cylinder, 5 to 6 horsepower, \$400. Half-top cover, reserve accumulator and tires, lamps, etc., are extra.

A type of American automobile which is seen occasionally in cities like Berlin, and which is conspicuous by reason of the apparent lack of domestic rivals is the electric runabout. This stylish, safe and convenient equipage is in a class by itself here, as no German cars are so well adapted for the use of women, for purposes of pleasure, shopping or making calls. Appealing as such car does to the fashionable city dwellers, and considering the ease with which it can be operated by a lady, American manufacturers, by advertising and exhibiting their superb electric vehicles in the German cities have good prospects of cultivating an exclusive and profitable trade.

Opportunity for Motor Wagons.

While America cannot teach Europe much in the construction of recreation cars, France, having for a long time set the pace for the whole world in touring and racing automobiles, it is different with commercial vehicles other than taxicabs. Inventive genius and progressive business methods, together with the high cost of labor of man and horse in the United States, have combined to lead a number of big American automobile firms to specialize in the construction of motor vehicles for commercial purposes. The foreign market for the latter is encouraging to those manufacturers who will follow methods that have brought success to American exporters of other mechanical appliances that save labor, facilitate business, and, above all, accomplish results in the simplest, most effective and economical manner.

In other words, the outlook for Ameri-

can automobile trade in Germany is more favorable when the motor vehicle is considered as an article not of luxury but of business utility. To be sure, motor taxicabs and omnibuses have for some time been a common feature of passenger transportation in the large German cities. Motor trucks are also considerably used for the delivery of beer and other heavy local freight. However, in the manufacture and use of self-propelled vehicles for light delivery service as well as for commercial purposes other than those mentioned, less progress has been made here than in the United States.

Disadvantages to Be Overcome.

The disadvantage of tariff and freight, to which American exporters are subjected in competition with German manufacturers, can perhaps be overcome, as it has in many other machinery lines, partly by lower cost of manufacture, due to large scale productions of standard patterns, and partly by the general superiority of American mechanical construction and operation. While in Germany there are automobile plants manufacturing commercial as well as other motor vehicles, there is no large scale production as we see it in many of the American plants. The German firms, with their comparatively small plants and limited equipment, manufacture commercial motor vehicles only upon order, which, of course, means great delay and ordinarily much higher prices than where selling from stock is made possible by large scale production of standardized types. The greater capital, enterprise, thorough factory organization and superior mechanical equipment of leading American plants, and their capacity for turning out quickly standard machines for a great variety of business requirements all make for moderate prices as well as simplicity, ingenuity and efficiency in mechanical construction.

American vs. German Vehicles.

In comparing American with German motor vehicles, especially those for delivery service and other commercial purposes, the up-to-date type of the former is generally superior to the latter in the following respects: (1) Less weight per unit of efficiency; (2) more complete interchangeability of parts, including removable power plant, so that machine is easier to repair and keep in order; (3) vehicle so constructed that the passenger body may be easily and quickly substituted for the delivery or freight body, thus enabling one

machine to answer the purposes of two; (4) greater accessibility of machinery and mechanical parts; (5) the simple mechanical construction of the typical American machine renders it easier for one who is not a mechanic to operate and keep the same in order, while the consequent reduction of labor and danger from accidents tends to increase sales among those who cannot afford a chauffeur; (6) greater ingenuity of construction and convenience of operation, and, in general, a more practical application of advanced mechanical ideas to meet the various requirements of merchants and other local carriers.

Essentials of a Trade Campaign.

Speaking generally about the marketing of American goods abroad, and without special reference to motor vehicles, it is unfortunate that so many American manufacturers, who have plants capable of supplying a heavy foreign demand, fail to establish abroad strong selling organizations similar to those that have enabled them to push their trade so successfully at home. It is difficult to understand why a manufacturer, who has found systematic organization and liberal advertising so necessary for building up a profitable business in the United States, will tackle the foreign market in the parsimonious and half-hearted manner that is frequently the case. The puny efforts exerted by many American firms to win trade in Germany are ridiculous in contrast with the energy and enterprise customarily displayed by them in competing for their share of the home market. The stereotyped method is to write to the American consuls for lists of dealers and agents in their respective districts likely to be interested in the articles in question. The next step is to send catalogs (generally in English only) to listed dealers and agents, and to offer selling agencies, much of this work being done in an indiscriminate and haphazard manner. If the correspondence between the manufacturer and those with curiosity enough to respond to his communications ever reaches the stage of appointing agents for certain territory, the would-be exporter is usually satisfied to "rest on his oars" and wait for the agent to send in the orders. Perhaps in a year or two he wakes up to the fact that the anticipated business has failed to materialize, and then either gives up the experiment in disgust or again proceeds with the ineffectual plan of appointing agents and attempting to do business by correspondence and the "absent treatment," the expenditure in thus handling the foreign trade being usually confined to the cost of postage and English-printed literature for German readers.

This mistaken policy must also be avoided by American manufacturers of motor vehicles if they wish to establish a profitable trade in this or any other foreign country. To those firms seriously prepared

to enter this strongly competitive field, the writer offers the following pointers, which are based upon his own observations and talks with automobile experts in Erfurt and other German cities:

German trade cannot be secured by correspondence and literature or even by agents alone. Prospective buyers must see the machine in actual operation. Exhibition rooms and judicious advertising are as useful here as in the United States.

The manufacturer should send to Germany a first-class representative, one expert in the business and able to speak German fluently, for the purpose of studying the possibilities and peculiar requirements of the market, trade conditions, facilities for advertising and methods of doing business. With his assistance an intelligent plan of campaign can be mapped out, central headquarters and local agencies established, and a strong selling organization formed to popularize and market the goods. No less thorough method can succeed where the motor vehicle to be introduced must meet the competition of similar kinds of domestic vehicles whose reputation in the market is already established.

Physical Domiciliation Advisable.

According to the opinions of automobile dealers and experts interviewed, an American manufacturer will not be in a position to compete on equal terms with the German factories unless he has, to a certain extent, physically domiciled his business undertaking in Germany. This does not mean the establishment of a factory or plant here, except insofar as may be necessary to assemble the machinery and parts if it be found more economical to ship in that way from the American factory. Whether or not, however, the vehicles are shipped knocked down or as finished cars, one or more workshops conveniently located are a necessary adjunct of the business in Germany. Aside from what assembling or overhauling may be required before selling or delivering a machine, the American manufacturer can best protect the reputation of his products by having here a repair plant and staff of expert mechanics thoroughly acquainted with the construction of the cars. If such facilities are lacking, the manufacturer's guaranty has little meaning to the prospective buyer. Furthermore, when for purposes of repair or alteration imported machines must be temporarily placed in unfamiliar, prejudiced or unfriendly hands, the consequent delay, unsatisfactory repairs, or unfair comparison with competing machines may lead to a loss of confidence on the part of the owner of the American car. In this manner first-class machines may be easily discredited and the chances for future business in the locality seriously injured.

A large proportion of the German motor vehicles are sold direct from the factory,

which has its own agencies and exclusive representatives in various localities. In case repairs are necessary, the machine is generally sent to the factory. Therefore the prospective German customer can hardly be induced to invest in an American machine if the exporter has not provided within easy transportation distance a workshop and other facilities for the prompt repair thereof and replacement of defective, broken or worn-out parts.

The second requirement in the domiciliation of the business is the establishment of supply and show rooms in the important cities where the business possibilities warrant such expenditure. The most elaborate catalogs and photographs will not alone suffice to sell motor vehicles here. The best advertisement is a permanent exhibition of the various types or models, and actual demonstration of their workmanship and operation.

Suggestions Concerning Advertising.

As to advertising propaganda the American manufacturer needs very little advice, as in progressive ideas he is usually ahead of his foreign competitor. Therefore in this department of business getting he does not need to pattern after German methods, but should wherever feasible employ methods that have been successful elsewhere, the more original the better. In this connection, however, it must be said that the German periodicals (other than the daily newspapers) have much less value as advertising mediums than the popular magazines in the United States. The circulation of the German monthly and weekly periodicals is comparatively small, and they are not read so extensively by business men as corresponding American periodicals. Show rooms, active selling agencies and attractively prepared catalogs are the essentials of a successful advertising campaign. American catalogs prepared at great expense are often wasted abroad through indiscriminate distribution. The advantage in marketing commercial motor vehicles is that one knows where to lay his hands upon possible customers. The field is a definite one. Therefore it would seem advisable to institute a follow-up system of circular letters go business firms that have wagons, trucks, or drays drawn by horses.

Catalogs that Appeal to Germans.

As to the preparation of catalogs for the German market, it is suggested that manufacturers should lay more stress upon the economies to be effected by the substitution of the particular make of motor vehicle for horsepower. Minute technical description, while valuable to the engineer and machinist, is often unintelligible to the merchant or business man, even though the same be translated into German, which is often very difficult to do. Knowledge of

mechanics and mechanical principles is not so widely diffused among laymen in Germany as in the United States. The principal feature of the typical German automobile catalog is not an elaborate exposition of mechanical details, but the testimonials of those who have purchased and operated the machine advertised, describing its smooth, comfortable driving, freedom from defects and disarrangement, speed and endurance, ability to climb hills and overcome topographical difficulties and adverse weather conditions, economy in the use of fuel, inconsiderable repairs, and other good points indicating its superiority over other machines with which the testifier may have had experience.

Advantages of German Incorporation.

If an American manufacturer proposes to establish in Germany a depot for receiving, assembling and distribution a chain of show rooms, stores or selling agencies, and possibly one or more repair shops at convenient points, he may find it advisable to organize the German branch of his business under German laws. The German business of some well-known American mechanical specialties is conducted by limited liability companies (*Gesellschaften mit beschränkter Haftpflicht*) organized under imperial laws.

The domestication, to this extent, of American business undertakings in Germany has been found advantageous from both a commercial and legal standpoint. There is always certain amount of prejudice against imported goods, which is obviated, to a large extent, when the articles are marketed under their German name and by German companies. Furthermore, the establishment of a German organization begets confidence among the dealers, who are inclined to be less timid in buying when it is not necessary to have recourse to a foreign house if goods prove to be defective or unsatisfactory, or if there are differences to be adjusted.

From a legal standpoint the policy is advantageous, in that it gives to the enterprise the character of a legal entity or juristic person, organized and existing under German law, and therefore enjoying all the rights of any similar German undertaking and subject to the same and no greater liability. The German branch of an American export business, thus legally domesticated, can sue and be sued like any other German company, and does not have to put up security for costs no matter who the shareholders may be. It has its own set of books, with a capital and expense account; taxation is based upon the capital and upon the earnings as shown by the balance sheet. If it operates under patents or licenses, it is at liberty to pay a reasonable royalty to the owners of the patent, which royalties are chargeable to expenses, and do not, therefore, enter into the profit subject to taxation.

AUXILIARY FLYWHEEL FOR SILENCE

British Manufacturer Employs Unique Device to Reduce Engine Vibration—Has Spring Controlled Couplings.

Much thought has been given to the reduction of engine vibration and with highly successful results, considering the intricate nature of the problem. One cause of vibratory effect which no special efforts have been made to suppress, up to this time, is that due to the spring of the crank shaft under the heavy thrusts of the explosive impulses. To some extent these periodic effects are absorbed by the fly wheel, but in general they are so sudden and violent

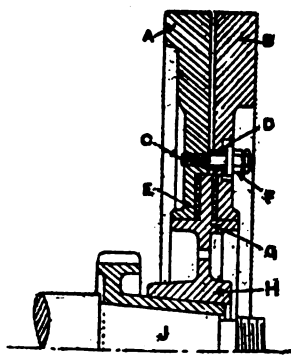


FIG. 1

that the shaft reacts against the wheel, thus producing a decided throb in the entire structure of the engine. It is the desire to suppress this particular vibrational quality, which sometimes is termed periodicity, that has led the makers of Rolls-Royce cars to devise an auxiliary flywheel driven from the main flywheel by friction alone.

The principle involved is that, by careful adjustment of the tension holding the main and auxiliary wheels together, it is possible to attain a point where the two

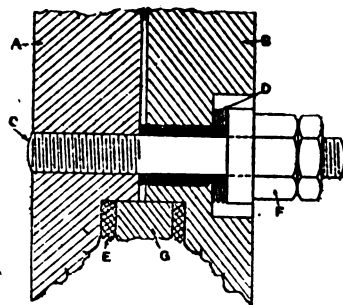


FIG. 2

wheels will rotate in unison under all ordinary impulses. Such shocks as are due to the cause it is attempted to remedy, however, are absorbed by the slipping of the auxiliary wheel. The amplitude and violence of the vibrations by this means are considerably reduced, it is claimed, while the natural purpose of the fly wheel in counterbalancing the irregularity of the cylinder pressures still is fulfilled.

Three essential parts comprise the auxiliary portion of the compound wheel, as shown in the accompanying Fig. 1. The inner part, or hub, is marked H, and is adapted to be fixed on the crankshaft J, either directly or indirectly, as shown through the boss of a gear wheel. There are also the two outer parts A and B, each of which is registered, on the shoulders G on the hub part H. Exterior to the shoulders G, the part H has a flange of suitable size and thickness. The inner faces of the outer parts A and B are shaped and adapted to engage the sides of the flange, and are held in frictional engagement with the sides by suitable transversely-arranged adjustable spring-controlled couplings. Between the engaging faces of the parts A and B and the flange are interposed discs E of any suitable material adapted to diminish wear.

A suitable spring-controlled coupling for the parts A and B is shown in Fig. 2. It consists of a series of studs F fixed to the part A, and projecting through holes in the part B, of lock-nuts threaded on the free ends of the studs, and of springs D interposed between the nuts (or loose washers bedding against the undersides of the nuts) and the adjacent face of the part B.

In applying the device, the springs D are adjusted to such a load as will ensure the free parts A and B of the fly wheel slipping relatively to the fixed part H, and therefore to the crankshaft, as soon as the angular acceleration of the crankshaft about its axis rises above a predetermined limit, which is not reached by the angular acceleration due to the normal load on said crankshaft, but is only reached when the end of the crankshaft is subject to angular vibrations about its own axis.

Air Leaks That Cause Queer Misfiring.

Bolts used to hold together two parts separated by a layer of comparatively soft material should be "set up" at frequent intervals to take up the play allowed by packing and condensing of the softer substance. An intake manifold, bolted to the cylinders with gaskets between, is a case in point. Mysterious misfiring often is caused by air leaks resulting from loose manifold bolts which are unsuspected because only recently tightened up.

When Constriction Affects Cooling.

The efficiency of any water cooling system depends not only upon the radiating surface, but upon the volume of flow. With a pump to cause the water to circulate the size of the fittings is relatively unimportant; however when dealing with the thermosiphon system any constriction at the numerous turns and angles means added friction, and considerably lessens the efficiency of the apparatus. The radius of curvature of all fittings connected with the system should be five times the diameter of the pipe to secure the best results.

No More Cranking

**"Never Again"—
that's my sentiment
on the crank question.**

With the Disco Starter, my car now starts from the seat. I don't get out of my car in snow, rain or mud to twist that cussed handle. My wife can drive the machine anywhere alone without fear of having to start it herself.

In many emergencies, the Disco saves dangerous delays as well as embarrassment.

I can't afford a chauffeur but I can drive a party to the opera and start for home afterwards with all the grace and dignity of the millionaire and his liveried servants.



When I think of the small cost at which my car was equipped — when I sum up the luxury of simply pressing the button and starting the engine, no matter how cold the weather, no matter how long the car has stood — I can't see why we

didn't enjoy the Disco Self Starter long since.

All my friends who are getting new cars are insisting that the manufacturers or dealers shall equip them with Disco Starters, and all those who have old cars are making them up-to-date with this simple little device. It has but 12 parts, weighs but 4 pounds, and you can have it put on any car in less than three hours.

DISCO Self Starter

A little three inch handle on the dash (or any other convenient place) is the only visible sign of the modern car equipped with the Disco. Its extreme simplicity and absolute dependability account for its approval by the experts of the automobile world, and its adoption by the largest manufacturers.

Put Those Motoring Troubles Behind You!

Don't wait longer, for the practical, successful Self Starter is here—is being manufactured, sold and shipped at the rate of three hundred a day. Prompt deliveries are guaranteed. Any dealer or garage man who has not the Disco already in stock can quickly get it for you. Insist on the Disco—the Self Starter that has revolutionized the automobile business.

AT NEW YORK the Disco Self Starter will be shown at both shows in space 549. See it here or at any of our branches.

IGNITION STARTER COMPANY

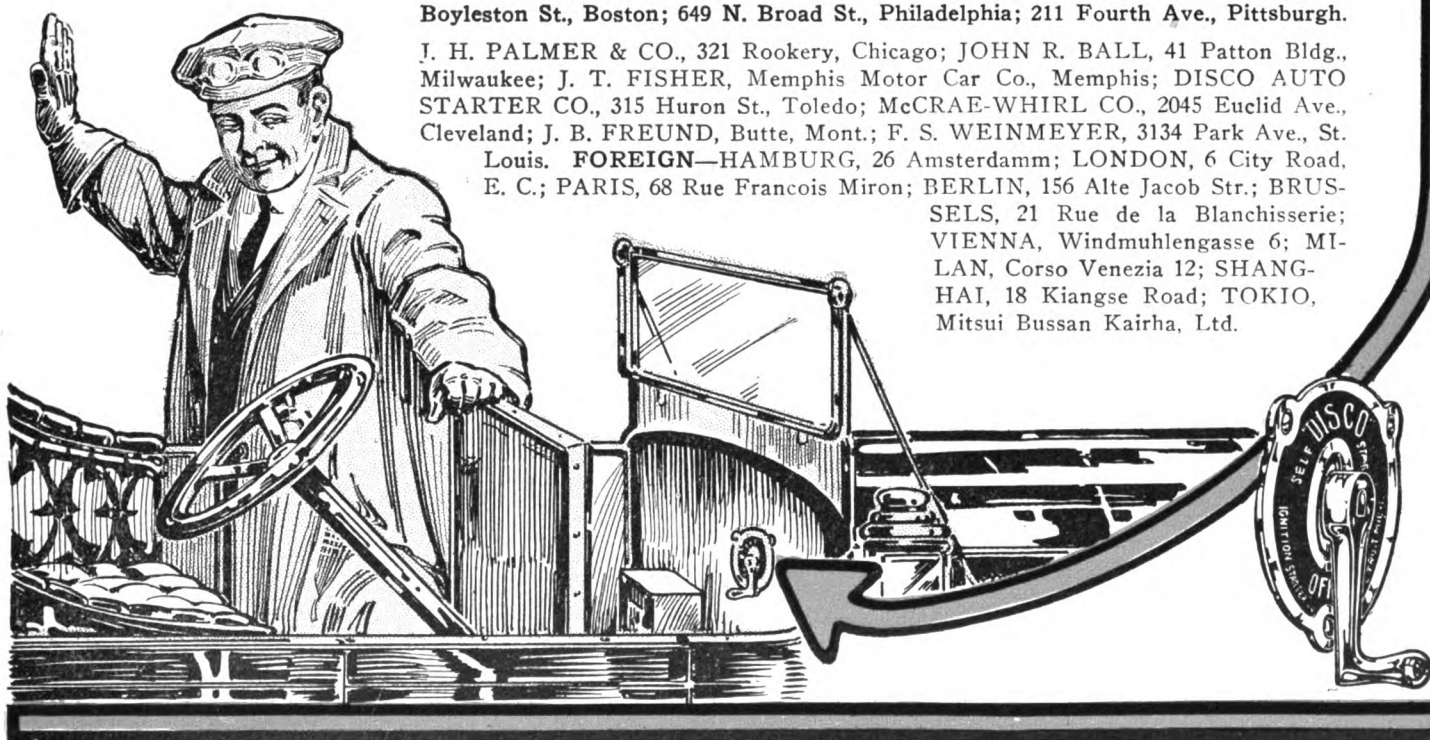
The Largest Manufacturers of
Self Starters in the World.

715 Ford Building

Detroit, Michigan

THE ARISTOS CO., Eastern Distributors, 250 West 54th St., New York; 1002 Boylston St., Boston; 649 N. Broad St., Philadelphia; 211 Fourth Ave., Pittsburgh.

J. H. PALMER & CO., 321 Rookery, Chicago; JOHN R. BALL, 41 Patton Bldg., Milwaukee; J. T. FISHER, Memphis Motor Car Co., Memphis; DISCO AUTO STARTER CO., 315 Huron St., Toledo; McCRAE-WHIRL CO., 2045 Euclid Ave., Cleveland; J. B. FREUND, Butte, Mont.; F. S. WEINMEYER, 3134 Park Ave., St. Louis. FOREIGN—HAMBURG, 26 Amsterdamm; LONDON, 6 City Road, E. C.; PARIS, 68 Rue Francois Miron; BERLIN, 156 Alte Jacob Str.; BRUSSELS, 21 Rue de la Blanchisserie; VIENNA, Windmuhlgasse 6; MILAN, Corso Venezia 12; SHANGHAI, 18 Kiangse Road; TOKIO, Mitsui Bussan Kairha, Ltd.



Two-Cycle Engines; What Has Retarded Their Progress

It is doubtful if there is any other subject, barring slide and sleeve valve motors, which is of greater interest to modern automobile engineers than that of the two-cycle engine. Naturally, "poppet-valveless" engines at present are receiving the greater amount of attention, but discussions of the two-cycle motor, like Tennyson's brook, "go on forever." The subject always has been of interest and probably it always will be, for, to quote a British engineer, "nearly every internal-combustion engineer has had at some period of his career an attack of what may be styled 'two-stroke,'" and such attacks are infectious as well as contagious.

"But," he states, in attempting a critical analysis of some of the mechanical difficulties presented by the cycle, with a view to their possible elimination or modification, "the majority of inventors appear to be so taken up with its possibilities that they rather ignore the impossibilities, whereas it is the latter that demand attention." "From the increasing number of two-cycle engines now being made," he continues, "it would appear that the border line between present practice and complete practical success must be a thin one; but while it may be thin it is none the less marked in most cases."

"In studying the cycle under review, it is well not to under-estimate the excellent features of the four-stroke cycle, and going into the pros and cons of the former tends to a fuller appreciation of the latter. Theoretically, almost the only flaw in the four-stroke engine is the lack of complete scavenging, otherwise the Beau de Rochas cycle is nearly ideally fulfilled. A deficiency that might be laid to its charge is that of the absence of expansive working, with consequent loss of the high exhaust pressure. The four-stroke cycle certainly does not include any really 'idle' stroke, often deprecatingly referred to: and in any case this so-called idle stroke is but transferred to the pump or its equivalent in the 'two-stroke' engine. At the same time it is well to bear in mind that the classical compression cycle of Beau de Rochas did not necessarily imply four strokes as essential to the cycle; and to carry out the pump functions in the working cylinder, while being simple, is not ideal. Combustion entails requirements that are not necessary for the processes of exhausting, charging, and compression, and it should be more efficient to provide separate cylinders, or their equivalent, adapted to the special requirements of the process carried out therein."

"Against this separation, however, must be set the slight loss incurred in transferring the charge from the pump to the work-

ing cylinder. As regards the matter of comparative thermal loss, this is somewhat swallowed up in the necessary waste by cylinder-cooling, but is in favor of the two-stroke cycle.

"In designing a two-stroke cycle engine, many points peculiar to the cycle, and of the greatest importance to its success in practice, present themselves for determination, and yet about which there are, so far, but scanty data for our guidance. Thus the ports call for serious calculation as to their area, position, mode of operation, and timing; while such matters as method of control, fuel supply, and type of air-pump all require careful weighing. It is, indeed, largely from the lack of essential data of this description that the 'two-stroke' engine suffers.

"A fundamental point for early consideration in design is that of the inlet and exhaust-ports, their size, position, and control. Both sets of ports should be of ample area; the inlet so that the fresh charge sweeps in in large volume and does not tend to mingle with the old charge so much as it would if forced in jet-fashion through confined ports; the exhaust should be of large area to allow of easy scavenging, with the minimum of back pressure, in the short time available. With reference to position, the simplest and most usual method is to place the two sets of ports opposite one another at the outer end of the cylinder, to be uncovered by the piston towards the end of its working stroke, for a period between one-fifth and one-quarter of the stroke. This arrangement must be carefully carried out with respect to exhausting and charging from the one end of the cylinder, with which in view it would seem better to make the stroke the same as, or not much greater than, the cylinder bore. With the ports thus opposite one another it is necessary to provide a baffle on the piston-head to deflect the incoming charge to scavenge the cylinder-head, and to keep the charge from blowing straight across out through the exhaust ports. For this purpose a stepped piston is preferable to the more usual piston deflecting plate, as the latter may have a tendency at times to become unduly hot, whereas a stepped piston, offering less area, has not this objection. In either case the baffle should be of ample proportions to ensure good deflection of the incoming charge. With the stepped type of piston the long side of the latter should preferably be arranged to take the connecting-rod power-stroke thrust. In its simplest form this disposition of ports entails the exhaust ports opening longer than necessary on the inward stroke; this being due to the exhaust ports requiring a lead

in opening to allow the cylinder pressure to drop as low as that of the incoming charge before the inlet is uncovered; and as in the ordinary way, the ports to be first uncovered will be the last recovered, the exhaust remaining open after the intake.

"Placing a non-return valve close to the inlet ports would allow of them being uncovered at the same time as the exhaust, but such a valve, or valves, would have to be large to afford free way for the incoming gases. Placing both sets of ports at the outer end of the cylinder allows of a simple cylinder casting, with the advantage of a valveless head, and with an interposed charge of air—a point to deal with later—a thorough scavenge can be effected from the one end without loss of mixture: thus this arrangement has much in its favor.

"The possible difficulties of exhausting and charging from the same end of the cylinder have led to the adoption of other port positions. A well-known alternative is that of having but one set of ports controlled by the piston, preferably for the exhaust, while the charge is admitted through a large poppet, or other valve, in the cylinder head. This affords larger port area, with an end-to-end sweep for scavenging, and automatically gives correct timing of the inlet relative to the exhaust, but sacrifices the advantages of a plain combustion head.

"A method of port control which has at least one notable exponent is that of utilizing two pistons in a common cylinder open at both ends, the compression and explosion taking place between the opposed pistons, there being thus no cylinder head; while the inlet ports at one end and the exhaust at the other end. While this arrangement affords an ideal through way from the inlet to the exhaust ports for scavenging, and incidentally relieves the main bearings of thrust, it is at the heavy cost of doubling the piston, with its connecting and crank throw. . . .

"The great weakness of the dual cylinder arrangement is very evident by noting that the same impulses are obtained from a number of cylinders working on the four-stroke principle. Moreover, the double set of pistons and rods does not afford any better balance than a single set. . . .

"A somewhat untried method of end-to-end scavenging is that of having a tubular tail-rod extension from the top of the piston, which tail-rod works in a sleeve extension on the cylinder-head. As the piston uncovers exhaust-ports in the cylinder walls, this extension, drawn out with it, leaves the cylinder-head at the time of in-

let, whereupon the fresh charge is forced up the tubular extension into the cylinder-head and so closes the inlet, the exhaust ports being covered by the piston. This tubular extension may be longer than the stroke, so that it does not leave the cylinder-head sleeve, in which case it has ports through its upper end. . . .

"A recent idea for obtaining an end-to-end flow between ports is that of having the ports in an internal reciprocating sleeve situate between the piston and cylinder, similar to the Knight sleeve-valve. The inlet ports are in one end of the sleeve and the exhaust in the other end, those at the inner end sliding behind an inverted cylinder head, while those at the outer end are covered by the piston, in the usual manner. . . .

"To gain the required opening in the small portion of crank revolution available 55 deg. to 65 deg. either side of the dead center—the travel of the sleeve has to be considerable, approximating half the piston stroke; but as the sleeve reciprocates in phase with the piston, the frictional aspect of this length of travel is not serious. Ports so controlled are slow opening and closing, and it should be observed that the sleeve is solely on account of the ports at the cylinder head end; indeed, the opening and closing of the outer end ports is adversely affected thereby, as the sleeve moving with the piston partially negatives the piston's motion over the ports in the sleeve.

"A revolving or oscillating sleeve has also been proposed for a similar purpose; but the possible area of ports so controlled is limited by the fact that the bars between ports must be the width of the ports plus coverage, thus leaving at most a total circumferential port width of but a third the cylinder circumference. Further, a revolving cylindrical member does not offer the same facility as a sliding one for being kept pressure tight. . . .

"In dealing with the usual short-comings of the two-stroke engines, a leading point is that of economy, in which is involved the matter of fuel supply. An ordinary method of supply for small engines is for the pump to draw in its charge through the carburetter, the mixture thus obtained being duly transferred to the cylinder, but in its simplest form this method entails serious lack of economy, from two causes; either in ensuring complete scavenge, part of the fresh charge is lost with the exhaust, or, on the other hand, the exhaust is not completely expelled, and a portion remaining in the cylinder weakens the fresh charge; in variable running both these effects may occur. Then there is danger of the incoming charge being ignited by the hot, possibly still burning, gases in the cylinder, with a resultant back-fire. These difficulties may be largely overcome by an interposed air scavenge—that is, admitting pure air alone before the mixture. This may be arranged in several ways; a simple method is for the pump to draw in through two inlets,

one which admits mixture direct into the main pump body, while the other admits pure air into an intermediate chamber between pump and cylinder. The intermediate chamber being adjacent to the inlet ports, the pure air therein enters the cylinder first, driven by the mixture following it. While a certain amount of intermingling of scavenging air and mixture inevitably takes place, such a scavenge is a marked advance. A method often adopted for large engines is that of having separate pumps for scavenging and charging. . . .

"While this duplicating of the pump is effective, it is at the cost of additional working parts, which, however, need not be prohibitive in a multi-cylindered engine. By effecting carburation between the pump and the cylinder, part of the air may be diverted and admitted direct for scavenging; this allows of a good separation of scavenging air and mixture if ports can be arranged to deal with the separate charges in proper sequence. In this case carburation has to be under pump pressure, at which pressure, therefore, fuel must be supplied. This principle of an initial charge of pure air is practically essential for efficient working.

"In its best form the scavenging volume should be variable for control purposes, and as less mixture is required proportionately more scavenging air should be supplied to ensure thorough sweeping out of the burnt gases, and to keep compression constant; though as regards this latter point a variable compression offers advantages for flexibility. Such scavenging should not be carried to an extent that unduly weakens the mixture by the inevitable intermingling. . . .

"Closely allied to the matter of economy and fuel supply is the question of control, embracing torque and speed range. That the large majority of two-stroke engines have comparatively narrow speed limits is an unfortunate fact, and one that is mainly due to two causes—one affecting the low-speed limit, and the other the high-speed limit. The limit of slow speed is reached when speed is therefore not of sufficient volume thoroughly to scavenge out the spent gases, part of which latter, remaining in the cylinder, adulterate the fresh charge, and so make it liable to misfire. This difficulty might be overcome to a considerable extent by the adoption of a variable scavenge of pure air to precede the admittance of mixture, as already dealt with, the volume of such scavenge charge to be increased as the volume of mixture was decreased.

"But as such scavenging air inevitably weakens the firing strength of the mixture, this system has its limits, and may not allow of particularly low speeds. The importance of this question of low-speed limit is enhanced by the fact that one of the main theoretical advantages of the cycle is that, owing to the double number of impulses, lower speeds should be obtained, whereas

in practice the average two-stroke engine cannot be run as slowly as the modern four-stroke type.

"The limit at high speed is reached when, owing to the speed, there is insufficient time for the function of scavenging and charging to be performed thoroughly. When it is borne in mind that the ports are not opened until over three-quarters of the outstroke, and closed correspondingly early this point may be easily appreciated at speeds ranging above 1,000 revolutions per minute. Indeed, if it were not for the inherent feature of gradual reversal of the reciprocating ports giving a comparatively long period at the end of the piston's travel, there could hardly be a two-stroke cycle. This matter of time for complete scavenging and charging at high speeds is not an easy one to deal with, as, should the ports open early in the piston's travel, to allow of high speed, then the power stroke is unduly shortened. . . .

"Going further into the question of speed range, it will be seen that with the embryo 'two-stroke' engines having the same port of opening and closing arbitrarily set such setting can only allow of efficient running at one certain speed, above and below which speed the setting is not correct. If, however, the timing of the ports be made variable, a greater proportion of stroke could be allowed for scavenging and charging at high speeds than at low, and vice versa. Thus, as engine speed fell, the cycle duration of port opening could be decreased, when the time duration would remain constant or be extended but slightly. Variable port opening of this description would allow full benefit to be taken of the increased time allowance at low speeds to get in a longer power stroke and larger charge, thus tending to keep torque up as speed fell, and so afford to some extent that valuable but elusive quality of flexibility in the true sense of the word. It must not be overlooked that this variable timing would have its effect on the compression; as the period of port openings was shortened, and the compression portion of the stroke proportionately lengthened, the volume for compression being thus increased, the compression pressure would be raised likewise. By fixing the minimum compression pressure at the maximum cycle period of port opening, the compression, and consequently the torque, could be increased as the engine speed fell. . . .

"The importance attached to silent running for automobile engines raises a minor issue in the point that the exhaust of a two-stroke engine is more noisy than that of a four-stroke, this being due to the longer period—more than half a revolution—allowed for emission with the latter type. While, of course, a generously-designed silencer mitigates this evil, it would be better met by the expansion cycle outlined, in which more work is taken out of the gases, so that they are liberated at a

lower pressure, and a longer period may be allowed for exhausting without curtailing the working stroke. . . .

"Although the subject of lubrication is one of importance, it does not offer any special difficulties peculiar to the cycle in general. When the outer side of the piston is utilized as the pump piston, provision has to be made for its proper lubrication, but no great difficulty is entailed thereby. Engines incorporating peculiar construction will have to be dealt with by provision to meet the special requirement; and it is important to keep this matter of lubrication in view in working out a design that departs from known practice. . . .

"While there are other matters of interest which might be touched upon, the foregoing might be said to constitute the chief mechanical features requiring the consideration of the designer. More of the problems are altogether insurmountable; indeed, many have been well met in recent practice, while the future promises further advance. As the engineer well knows, it is not a matter of striving for an ideal design, in which all theoretical faults are eliminated, but evolving one which will afford a practical working compromise without any outstanding fault, functional or mechanical. Apart from the theory of design, the financial aspect is one of great importance. Other things being equal, it is easier to market an engine the design of which lends itself well to cheap shop production, than one which may be a little more efficient, but is expensive to put through the shops. The inventor and designer have to exercise care in their calculations to see that the term 'indicated horsepower,' is not used to the entire exclusion of dollars and cents.

"It is not sufficient for a two-stroke engine to be an interesting mechanical success, it must possess advantage in some, if not all, of such points as simplicity, economy, flexibility, weight, and size. While this is obvious, it is surprising to note the number of two-stroke designs that are more complicated than that of a four-stroke engine giving similar, or better, results; the natural advantages of the cycle being in many examples practically nullified by the mechanism entailed to ensure them.

"While the simplest two-stroke engine is not as efficient as the more complicated and refined four-stroke engine, its very simplicity entitles it to a certain freedom from comparison. This primitive simplicity has to be abandoned if fuller efficiency is to be obtained; but it is undesirable to go to the other extreme of obtaining a theoretically satisfactory cycle of operations at the expense of considerable auxiliary complications, such as an inspection of the patent records only too fully exemplifies. It is comparatively easy to work out a feasible two-stroke engine by incorporating without limit pumps, mechanical valves, etc.

"But while such a design might include nothing but sound engineering practice in

all its components and motions, and make suite a workable engine, the number of its parts at once puts it right out in competition with a four-stroke engine giving the same number of impulses. Or it is possible to obtain an ideal sequence of operations—at least on paper—by aid of giant cams, toggles, or other abominations; but an engine depending upon such mechanism having irregular motion, especially if entailing an extremely high speed or quick reversal of some important part of one period, stands no chance of ever being more than interesting.

"At the same time, in dealing with small engines for special work, it is well to bear in mind that size modifies design, and some mechanical arrangements, which would not be desirable for a large engine, might well be quite legitimate and advantageous in a small type. With the foregoing in view, a designer might start with the simple primary type as a base to build up on with additions and modifications for overcoming its initial deficiencies; or, conversely, take a theoretically perfect but complex type, and modify it by elimination so that without undue complication the advantages of the cycle are given full scope. The fact that many poorly designed and cheaply-made engines work as well as they do on this cycle is encouraging to the designer with a well-equipped works behind him.

"Much of the antipathy of engineers against the two-stroke cycle is due to so many of the smaller engines of this cycle on the market being sadly behind in finish, both as regards design and workmanship; and too often most exaggerated claims, based on the cycle, are put forward for these very engines—an exaggeration quite uncalled for, as the cycle offers sufficient legitimate claims. Referring to the more sweeping claim so often put forward, of double power to the four-stroke cycle, in the ordinary way it is impossible to obtain full double the power of a four-stroke engine of equal cylinder capacity, and there is no reason why such should be expected. Of course, increased power can be obtained by additional components, as in super-compression, but at the expense of complication and consequent losses, and, in the matter of comparison, super-compression is also applicable to the four-stroke engine.

"As initially intimated, this resume may to some extent be regarded as a pessimistic view of the matter, in which the advantages of the cycle have not been emphasized; but when the deficiencies touched upon are overcome totally, or in part, the legitimate claims of this cycle will place it as a strong competitor of the once nearly universal four-stroke cycle. With such advantages of better torque, greater speed range, more even stresses, less weight, and absence of half-speed shaft, and perhaps gearing, there is indeed much worth striving for. And once the cycle obtains a sound commercial footing, it may be relied on to advance towards practical idealism by that gradual

but sure evolution of constant refinement brought about by practice, and by practice only."

Possible Openings in the Yukon Valley.

Automobiles of suitable construction could be used in the Yukon to advantage if more attention were given to the construction of roads, especially for winter use, according to Consul G. C. Cole, of Dawson, Canada, who says:

"It has been claimed by some that the automobile could not be successfully used in a cold climate like this because the gasoline would congeal, but local tests in the last two years in all kinds of weather have proved that theory incorrect, and also that they can be used as successfully here as in any other country, provided slight changes be made in the construction of the machine and the roads.

"Two years ago a large automobile was used successfully during the winter in Dawson and on suitable country roads," he adds: "Last winter the White Pass & Yukon Route Co., which operates a 330-mile stage line in winter between White Horse and Dawson, tried an automobile, but it did not prove satisfactory, as the automobile's gauge was much wider than that of the sleds which they were using and the sled track could not be used.

"The snowfall in the Yukon Basin between the first of October and the last of April—usually about two feet—remains on the ground until melted by the sun in the spring. By midwinter the track is worn down in the snow by these narrow-gauge sleds until the banks on either side are 18 to 24 inches high, making it difficult if not impossible for a wider-gauge vehicle of any kind to pass over the road.

"There being no blizzards and little wind in winter in the Yukon Valley, there are no snowdrifts to contend with, except on timberless ridges. The roads usually have low and even grades and were they of suitable width would be well suited for motor vehicles. These roads, or trails, were originally made 15 to 24 inches wide to accommodate the dog sled. When horses took the place of dogs these trails were widened to accommodate the "double-end" one-horse sled, which is long and narrow, with the runners turned up at both ends to save reversing the sled, which is difficult to do on such narrow roads when turning back. In recent years some of these roads have been widened for the use of wagons in summer, over which heavy loads are drawn by two, four, and six horses.

"If some enterprising motor-vehicle company would construct a motor car of the width of the sled now in use in this country, it could be used to great advantage throughout the whole Yukon Valley.

"The time now occupied by stage between White Horse and Dawson is five to eight days, with relay stations at 20-mile intervals, while an automobile should make the journey at any time within two days."

WHEN THE SNOW REALLY IS BEAUTIFUL AND FORMS A PICTURESQUE SETTING EVEN FOR A MOTOR CAR

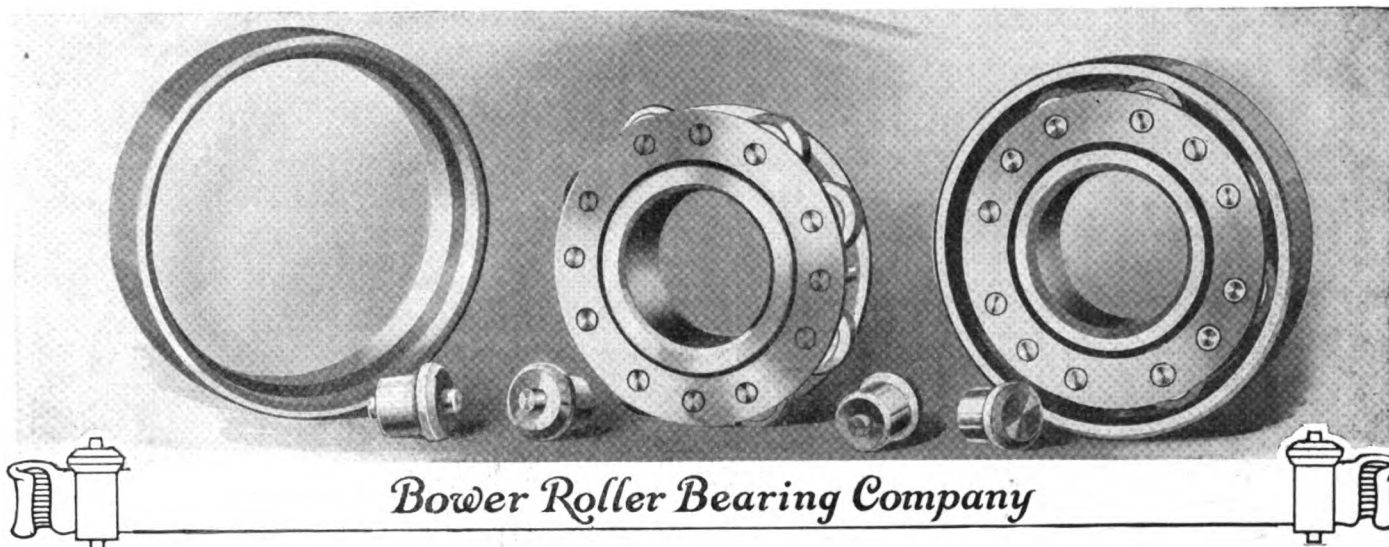




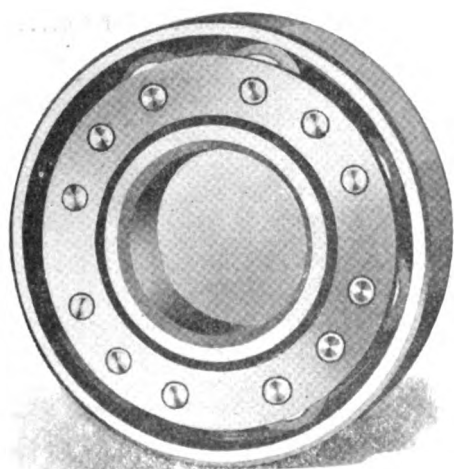
INDEX TO ADVERTISERS



A		O	
Adamson Mfg. Co.	190	Oakland Motor Car Co.	200
Ajax-Grieb Rubber Co.	96	Owen, R. M., & Co.	91
American Ball Bearing Company	87	P	
American Motors Co.	116	Packard Electric Co.	238
American Starter & Carbureter Mfg. Co.	237	Parish & Bingham Co.	190
Amos Post Garage & Repair Shop	190	Parish Mfg. Co.	192
Apple Electric Co.	192	Perfection Spring Co.	192
Argo Electric Co.	108	Petrel Motor Car Co.	237
Atwater-Kent Mfg. Co.	192	Pierce-Arrow Motor Car Co.	F. C.
Automobile Supply Mfg. Co.	105	Premier Motor Mfg. Co.	119
B		Pullman Motor Car Co.	240
Badger Brass Mfg. Co.	190	R	
Barthel, Daly & Miller	238	Remy Electric Co.	89
Bartholomew Co.	236	R. I. V. Co.	226
Bosch Magneto Co.	235	Roser, Hermann, & Son	237
Bossert Co.	192	Royal Equipment Co.	238
Bower Roller Bearing Co.	187	S	
Bretz, J. S., Co.	198	Sackman Mfg. Co.	230
Bricton Mfg. Co.	196	Safety Tire Gauge Co.	192
Briggs-Detroit Co.	90	Salisbury Wheel & Mfg. Co.	238
Briscoe Mfg. Co.	225	Sampson, Alden Mfg. Co.	95
Brown-Lipe Gear Chapin Co.	193	Schrader's Son, A., Inc.	230
Brush Runabout Company	95	Selden Motor Vehicle Co.	97
Bush Mfg. Co.	193	Shaler, C. A., Co.	109
C		Shawmut Tire Co.	231
Cartercar Co.	99	Sparks-Withington Co.	202
Chalmers Motor Co.	78	Speedwell Motor Car Co.	236
Champion Ignition Co.	226	Splittorf, C. F.	115
Chicago Flexible Shaft Co.	231	Springfield Metal Body Co.	192
Clark-Carter Automobile Co.	122	Standard Roller Bearing Co.	192
Classified Advertising	191-92	Standard Welding Co.	135
Colby Motor Co.	234	Standard Oil Co.	235
Columbia Motor Car Co.	94	Stearns, F. B., Co.	236
Continental Motor Mfg. Co.	192	Stewart & Clark Mfg. Co.	82
Corbin Motor Vehicle Co.	236	Stromberg Motor Devices Co.	81
Cover Motor Vehicle Co.	103	Studebaker Corp.	86
Cramp, Wm. & Sons, Ship & Engine Building Co.	238	Stuyvesant Motor Car Co.	228
Crosby Company	235	Swinehart Tire & Rubber Co.	114
D		T	
Dayton Motor Truck Co.	94	Thomas, E. R., Motor Car Co.	102
Dayton Rubber Mfg. Co.	98	Timken-Detroit Axle Co.	129
Dean Electric Co.	133	U	
Diamond Chain & Mfg. Co.	225	Union Sales Co.	236
Diamond Rubber Co.	111	United Rim Co.	134
E		U. S. Auto Horn Co.	237
Electric Welding Products Co.	193	United States Motor Co.	94-95
Empire Tire Co.	234	United States Tire Co.	Inside Cover-77
F		V	
Fedders Mfg. Co.	233	Velie Motor Vehicle Co.	83
Federal Rubber Mfg. Co.	104	W	
Fiat	190	Warner Gear Co.	240
Firestone Tire & Rubber Co.	123	Warner Instrument Co.	117
Fisk Rubber Co.	79	Weed Chain Tire Grip Co.	92
Ford Motor Company	132	Western Motor Co.	238
G		Weston-Mott Co.	194-5
Goodyear Tire & Rubber Co.	192	Wetherill Finished Castings Co.	240
Gray & Davis	88	Willys-Garford Sales Co.	B. C.
H		Willys-Overland Co.	136
Greenville Metal Products Co.	238	Winton Motor Car Co.	236
Grossman, Emil, Co.	201	Wisconsin Motor Mfg. Co.	193
I		N	
Hartford Auto Parts Co.	227	National-Acme Mfg. Co.	207
Hartford Suspension Co.	80	National Motor Vehicle Co.	226
Havers Motor Car Co.	208	Nordyke & Marmon	234
Hayes Mfg. Co.	106	Not-A-Crank Gas Engine Co.	209
Haynes Automobile Co.	125-26-27-28	10-11-12-13-14-15-16-17-18-19-20-21-22-23-24	
Henderson Motor Sales Co.	234	O	
Hot Spark Plug Co.	203-4-5-6	P	
Hupp, R. C.	100-101	R	
Hupp Motor Car Co.	124	S	
Hyatt Roller Bearing Co.	93	T	
J		U	
Ideal Motor Car Co.	234	V	
Ignition Starter Co.	180-181	W	
Inner Shoe Tire Co.	199	X	
International Accessories Corp.	197	Y	
Invincible Starter Co.	131	Z	
K		A	
Kellom, Chas. F., & Co.	190	B	
Kinsey Mfg. Co.	229	C	
Kissel Motor Car Co.	118	D	
Kline Motor Car Corp.	240	E	
Knox Automobile Co.	234	F	
L		G	
Lauth-Juergens Motor Car Co.	228	H	
Leather Tire Goods Co.	239	I	
Locomobile Company	192	J	
Lovell-McConnell Mfg. Co.	Inside B. C.	K	
M		L	
Mais Motor Truck Co.	237	M	
Manhattan Electrical Supply Co.	235	N	
Marion Sales Co.	234	O	
Marquette Company	107	P	
Maxwell-Briscoe Motor Car Co.	95	Q	
Mayo Radiator Co.	79	R	
McIntyre, W. H., Co.	237	S	
Metz, C. H.	236	T	
Michelin Tire Co.	240	U	
Michigan Buggy Co.	236	V	
Michigan Crank Shaft Co.	192	W	
Miller, Chas. E.	84-85	X	
Moline Automobile Co.	113	Y	
Mosler, A. R., & Co.	192	Z	
Moss Photo Engraving Co.	232	A	
Motor Car Equipment Co.	190	B	
Motor Wagon Co. of Detroit	120-121	C	
Mott Wheel Works	238	D	
Motz Tire & Rubber Co.	229	E	



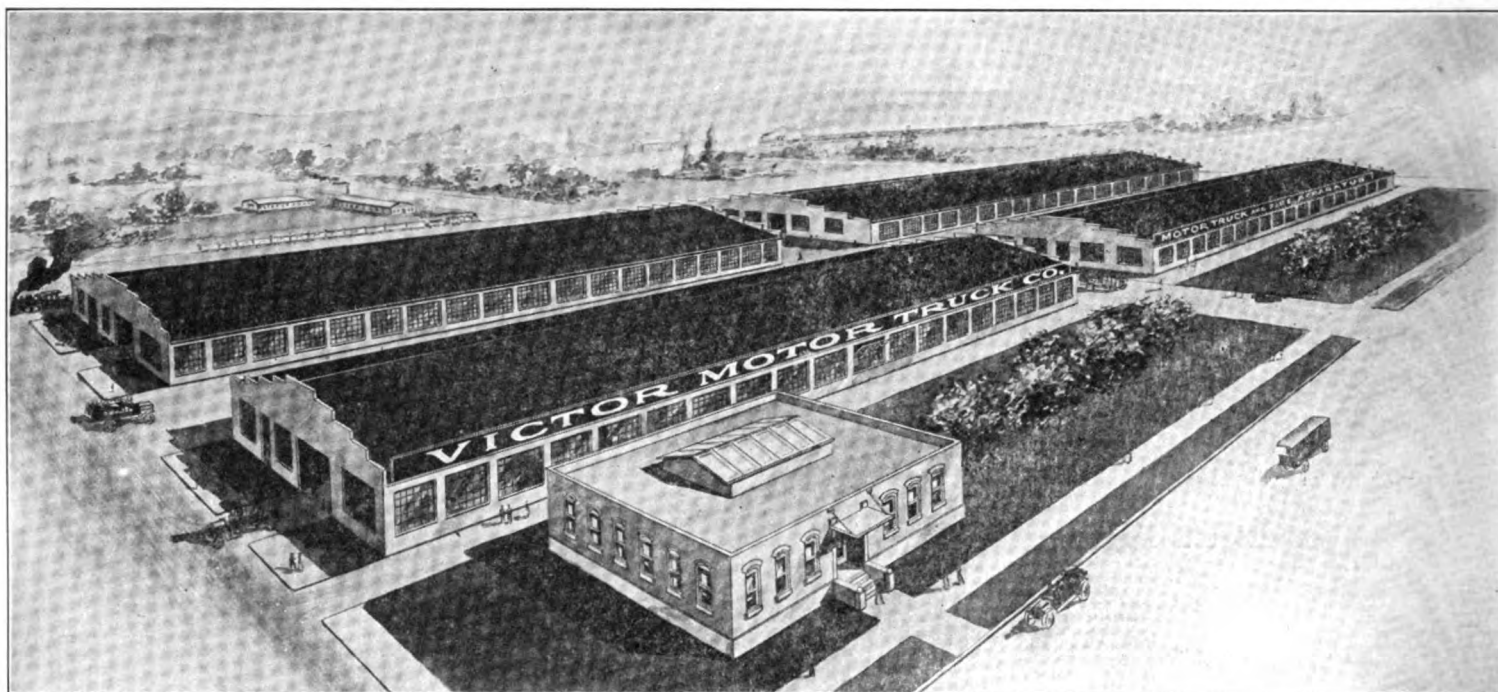
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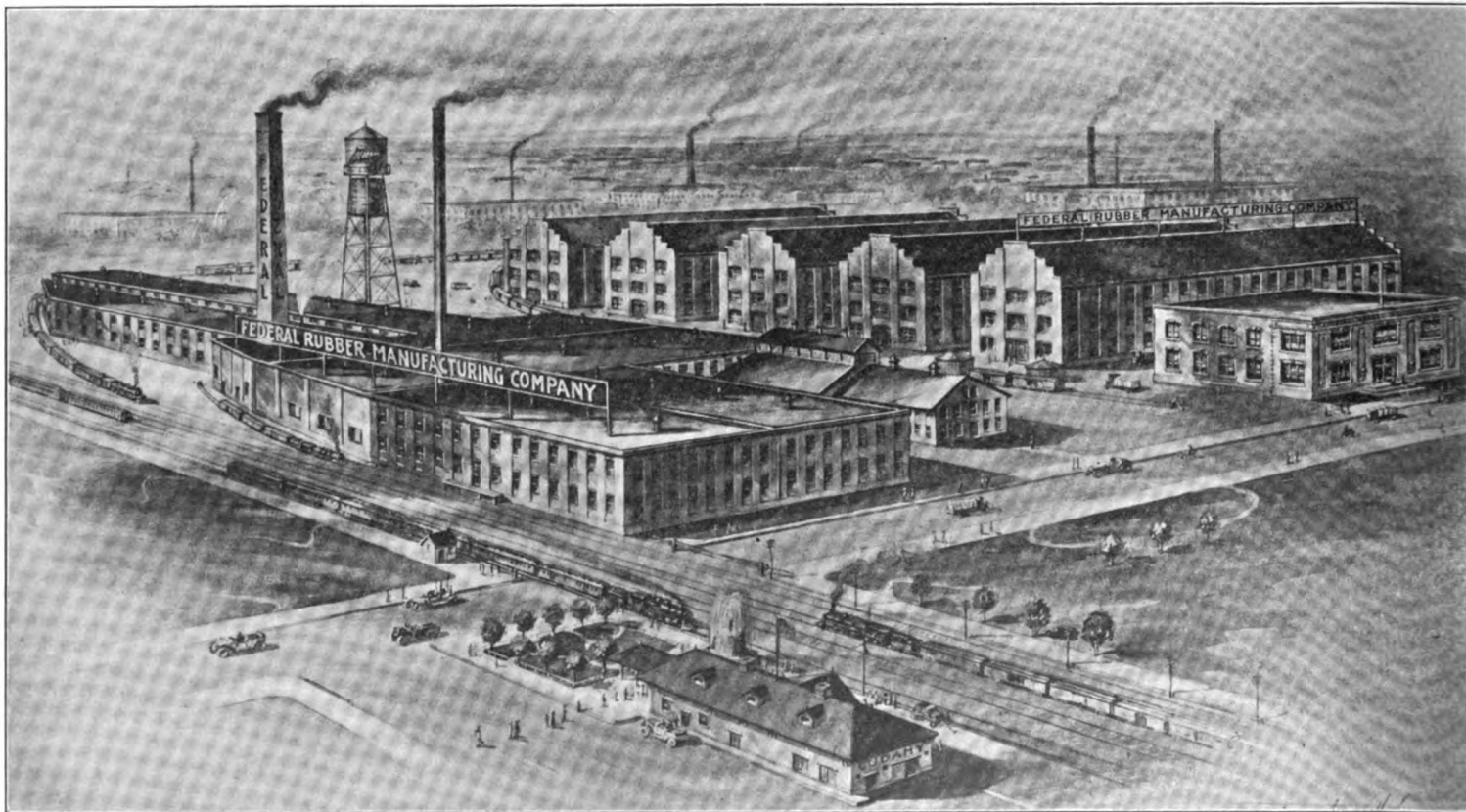
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998,162. Warning Signal Device. William W. Dean, North Ridgeville, Ohio, assignor to The Dean Electric Company, Elyria, Ohio, a Corporation of Ohio. Filed May 1, 1911. Serial No. 624,329.

1. In a device of the class described, the combination with a conveyance of a warning signal device carried thereby, a plurality of parts of said device forming the walls of a chamber, one of said parts having an opening therein for the passage of sound waves, a vibratile member mounted in said chamber being provided with a perforation for the escape of foreign matter, said last named part being adjustable to position said perforation at any point on the periphery of a circle and means to operate said vibratile member.

998,179. Motor Car. William S. Hovey and Charles B. Stebbins, Three Rivers, Mich., assignors to Sheffield Car Company, Three Rivers, Mich. Original application filed Mar. 1, 1909, Serial No. 480,811. Divided and this application filed July 1, 1909. Serial No. 505,378.

1. In a structure of the class described, the combination with the traction wheels, of a running gear frame, comprising a pair of outer longitudinal sills, cross pieces at the front and rear thereof, said crosspieces having yoke-like central drops therein, trusses for said cross pieces, a pair of inner longitudinal sills, uprights on said cross pieces, on which said inner longitudinal sills are mounted, an engine mounted on and arranged between said inner longitudinal sills at the forward end thereof, above the forward cross piece, the crank shaft of said engine being arranged longitudinally of said frame; a transmission comprising a transmission gearing casing mounted on and arranged between said inner longitudinal sills at the rear of said engine, a driven shaft arranged transversely of said casing below said inner longitudinal sills, driving connections therefor to said traction wheels; and a storage reservoir mounted upon and arranged between said inner longitudinal sills at the rear of said transmission casing and above the rear cross piece.

998,227. Variable Speed Gearing. John S. Barnes, Rockford, Ill., assignor to W. F. & John Barnes Company, Rockford, Ill., a Corporation of Illinois. Filed Feb. 23, 1910. Serial No. 545,542.

1. In variable speed gearing, the combination with coacting shafts, of gears mounted on one of the same, shiftable gears mounted on the other shaft and movable into and out of mesh with the first gears, a support, a rod mounted on the support and located alongside the shafts, and a fork slidably mounted on the rod and engaging the shiftable gears to move the same along the shafts, said fork having spaced bearing lugs that slidably engage the support to prevent the fork turning on the rod.

998,241. Spring Vehicle Wheel. William H. Fahrney, Chicago, Ill. Filed Feb. 13, 1911. Serial No. 608,220.

1. In an elastic vehicle wheel, the combination with a wheel center, of a rim provided with radially-extending spaced pro-

jections comprising stems terminating in heads forming roller bearings and rollers journaled on said bearing spring bands extending about the rim under and confined by expansion against said rollers, and an annular tire portion surrounding the rim and provided with internal rollers forming projections registering with the spaces between said heads to engage the spring bands through said spaces, for the purpose set forth.

998,277. Variable Speed Power Transmission Device. Georges Edouard Caude-ray and Jean Charles Chauve, Paris, France. Filed Dec. 17, 1909. Serial No. 533,622.

1. A variable speed power transmission device comprising a main shaft provided with a crank stud, a shaft, a ratchet wheel keyed thereon, levers mounted freely on the last named shaft and radiating therefrom, a pawl carried by each lever and engaging said ratchet a connecting rod from each of said levers, and working beams with each of which two said rods connect, said working beams intersecting each other and being mounted on said crank stud of the main shaft.

998,314. Automobile Attachment. Joseph A. Wilkinson, Eureka, Kan. Filed Oct. 19, 1910. Serial No. 587,966.

1. An attachment for motor cars comprising a jointed frame provided with a fender, a check box carrying a plurality of identification checks, and a slidable bar having connection with said frame for causing the escape of a check from the check box upon contact of the fender with an obstruction such as a human being.

998,320. Weather Screen for Vehicles. Arthur Collins Auster, Birmingham, England. Filed Jan. 12, 1910. Serial No. 537,667.

1. In a weather screen for association principally with the back seat of open vehicles, a transversely disposed screen element and a pair of folding horizontally extensible supporting arms therefor, each arm being self-sustaining in a horizontal plane and embodying sections which are mutually associated for relative movement, a connection between one of the sections of each arm and said screen element, the connection including a vertical pivot for the arms, a horizontal pivot for the screen element, and means for locking the latter at different positions on its horizontal pivot, and a vertical pivot connection between the other section of each arm and a stationary support.

998,355. Carburetter for Internal Combustion Engines. Philip Douglas Lee, London, England. Filed Sept. 24, 1910. Serial No. 583,554.

1. In a carburetter for internal combustion engines, the combination with a throttle valve and means for operating the same, of a spring influenced auxiliary air valve adapted to be opened by engine suction; and means whereby said throttle valve may be opened and the resistance to opening of said air valve proportionately increased, or said throttle valve may be closed and the resistance to opening of said air valve proportionately decreased, whereby the proportions of the combustible mixture for engine operation are kept constant at all engine speeds and throttle openings.

998,395. Self Lubricating Wheel. Samuel S. Rigby, New Castle, Pa. Filed Mar. 14, 1911. Serial No. 614,407.

1. A self-lubricating wheel including a hub provided with a lubricant reservoir and further provided with channels for es-

tablishing communication between the reservoir and the central bore of the hub at a point removed from the reservoir, said hub having its inner side provided with means to constitute a chamber, a cap plate for closing said chamber, a pair of packing rings mounted in the chamber, a washer interposed between the packing rings, each of said packing rings formed of two sections, pins carried by the hub and extending between the sections of one of said packing rings, and pins carried by the cap plate and extending between the sections of the other of said packing rings.

998,413. Puncture Closing Device for Pneumatic Tires. Abraham Smith, Stuart, Neb. Filed Oct. 31, 1910. Serial No. 589,860.

1. The improved device for the purpose specified, comprising a clamp formed of metal capable of holding its form under compression and having a body portion consisting of separated but parallel parts, and connecting end portions which diverge laterally from the body, all constructed integrally, as shown and described.

998,418. Engine Starting Device. Gregory J. Spohrer, Franklin, Pa. Filed Feb. 11, 1911. Serial No. 608,013.

1. In an engine starting device, the combination with a cylinder and a piston mounted to reciprocate therein, of a gear loosely mounted on the engine shaft, a rod extending from the piston through one end of the cylinder having rack teeth formed thereon for engagement with the teeth of said gear, a valve in one end of the cylinder, means carried by the piston rod to engage and open said valve in the movement of the piston in one direction, said cylinder having an exhaust port at its other end, an air supply tank to supply air to said cylinder valve, and means under the control of the operator to admit air through said valve to one end of the cylinder to move the piston in one direction and rotate the engine shaft, such means normally exhausting air from the same end of the cylinder in the reverse movement of the piston.

998,457. Carburetter. Herbert Bingham, Lakewood, Ohio. Filed July 16, 1910. Serial No. 572,301.

1. In a carburetter, a fuel chamber, a head adapted to close the top of the fuel chamber and carrying an outlet port, a valve disposed within the outlet port, and independent relief conduits both communicating with the fuel chamber, one communicating with the outlet port below the valve and the other communicating with the outlet port above the valve, and independently adjustable.

998,458. Apparatus for Braking Vehicles. Louis Boirault, Paris, France. Filed Dec. 23, 1909. Serial No. 534,631.

1. In a brake of the character described, the combination of a cam secured to the axle of a pair of wheels, a lever actuated by the said cam and connected to the members of the brake, a mechanism serving to move the lever toward or away from the said cam and also to lock the said members in the position for applying the brake, a shaft actuating the said mechanism and which can be operated by hand, a controlling device of the said shaft operating under the influence of the loosening or rupture of a coupling, and clutch mechanism allowing of the shaft being rendered independent of the said controlling device.

998,463. Internal Combustion Engine. Alphonse Butsch, St. Lucia, British West

Indies. Filed Sept. 9, 1910. Serial No. 581,128.

1. In an internal combustion engine comprising a cylinder and a piston arranged to reciprocate therein, a fuel pump for supplying the engine with fuel, and a motor for the fuel pump comprising a cylinder having opposite ends in communication with the engine cylinder and a piston having opposite faces of different areas arranged within the cylinder and adapted to be actuated by the compression and expansion of the gases in the cylinder of the engine.

998,501. Headlight Shade. John R. Green, Dalhart, Tex., assignor of one-half to Peter Kilduff, Chicago, Ill. Filed Feb. 3, 1910. Serial No. 541,810.

1. In combination with the forward portion and lens of a headlight, a swinging shade therefor in the form of an apron substantially straight in its longitudinal direction and provided with downwardly hanging side walls of substantial depth, the shade being pivoted to the upper portion of the headlight body rearwardly of the lens, and being of such a width that the downwardly hanging side walls extend out-

wardly beyond the sides of the body of the headlight to permit the shade to be swung downward an amount to partially cut off the main beam of light, and the side walls embracing the body portion to prevent the escape of light sidewise past the shade, whereby that portion of the beam of light which is directed horizontally down the track is cut off and that portion thereof which illuminates the track immediately in advance of the locomotive is not cut off, substantially as described.

998,516. Band Clutch. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Feb. 25, 1909. Serial No. 479,966.

1. In a device of the class described, the combination with a rotatable shaft, of a split ring clutch carried thereby, a pivoted arm connected at one end to contract and expand said split ring and having its other end bifurcated, and a sleeve slidably mounted on said shaft provided with parallel inclined surfaces upon opposite sides engaging said bifurcated end to turn the arm upon its pivot.

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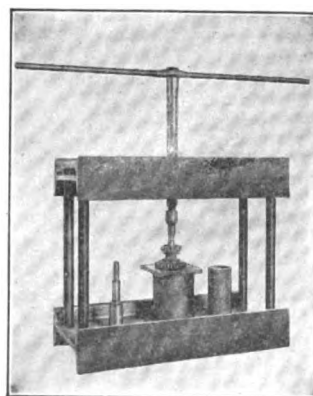
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Maxwell "Messenger"

THIS two cylinder, 16 horsepower roadster costs less to buy, does as much work, goes just as far, almost as fast, at one-half the cost of a four cylinder car. It proved in public test it can do three times the work in half the time, for half the cost of a horse and buggy. Holds economy and endurance records by the score. World's records, too. It has a speed of 30 miles per hour. The flush-side, fore-door, all-steel torpedo body is of latest design, and there is the new feature of a luggage compartment at the rear.

Its simplicity of construction throughout makes it easy to drive and care for, and insures absolute dependability and freedom from repairs. Ideal ladies' car.

\$625

F.O.B. Factory. Top Boot extra.

Season's prettiest design. Ample leg room comfortable seats, large fuel capacity make it splendid for touring. More than 16,500 physicians and 2,427 merchants use Maxwells.

These books sent on request: "History of the Glidden Tour," interesting and thrilling; 1912 Catalog and "How to Judge an Automobile."



United States Motor Company

Maxwell Division

1 West 61st Street at Broadway, New York

New York Show Number—Pleasure Cars

(MADISON SQUARE GARDEN)

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Here, Gentlemen, Are the Strongest Tires in the World

United States Tires



UNITED STATES TIRES have been the predominant tires, leading all others in sales and popularity, during the year just past. And 1912 is going to be a still *greater* year.

It's not our advertising that has established our leadership. It's the *tires*. It's the service they have given for years and, in still greater degree of efficiency, are giving today for *thousands* of motorists everywhere. It's the way United States Tires stand up under hard usage, on every kind of car and every kind of road. It's the way they run; the way they *last*.

The motor car owner cannot hope for United States service from other tires, for he cannot find the *strength* of United States Tires in any other tire. Here in each of our four famous brands, G & J, Hartford, Morgan & Wright and United States, we have combined the strength of *all four*. In the making of each we have brought to bear the skill and experience and peculiar points of superiority which have made famous

each of the three others. No other tire company would even presume to claim for its product such elements of strength.

The year 1911 has seen thousands of tire-users *quit experimenting*. Thousands have taken advantage of what a great army of other tire-users had learned before—that it pays—literally pays, in dollars and cents—to use United States Tires. And this year thousands *more* will quit experimenting for the same reason—because it pays.

Our four great factories, running day and night, our three central offices, our scores of branches and agencies and our thousands of dealers all over America give users of United States Tires an *added* service advantage which no other tires offer.

The Strength of Four in Every One

United States Tires are made in four styles of tread, including the famous Nobby Tread, and the price is no higher than asked for other kinds obviously manufactured under less favorable conditions.

UNITED STATES TIRE COMPANY

Broadway at 58th Street, New York



Providence Plant



Hartford Plant



Indianapolis Plant



Detroit Plant



FLANDERS AND UNIVERSAL TO MERGE

Mystery Surrounding Recent Sale of Detroit Truck Company Begins to Lift—Milwaukee Men Interested.

Some of the mystery surrounding the recent purchase of the Universal Motor Truck Co., of Detroit, by interests represented by Howard W. Walton, of New York, has been cleared up. The Universal company is to be merged with the Flanders Mfg. Co., of Pontiac, Mich., and it is possible that the merging movement may not end there.

At the time of the consummation of the purchase of the Universal company, Walton, who is president of the Universal Motor Car Co. of New York, the metropolitan agent for the Universal truck, stated to the Motor World that the purchasers were New Yorkers with unlimited capital, who would remain in the far background and under no consideration permit their identities to become known, which may or may not have been a purely diplomatic statement. At any rate, Walton himself is the only New Yorker whose connection with the transaction has been disclosed.

The others are Western men identified with the Universal and Flanders companies chiefly Walter E. Flanders, George Uhlein, who is identified with the Schlitz brewing interests in Milwaukee, and A. O. Smith, president of the A. O. Smith Co., of Milwaukee. Smith is also vice-president of the Flanders Mfg. Co., and only recently Uhlein, who already held stock in both the Smith and Universal companies, purchased a large block of stock in the Flanders Mfg. Co. Because of Smith's participation in the many conferences which have been held, the report got abroad that the Smith company would be included in the merger, but this is emphatically denied by officials of the Smith company, who should be in a position to speak with assurance.

The basis of the Universal-Flanders merger and the exact scope of it have not

yet been clearly defined. The Flanders company itself, however, will bring into it five different plants, four in Pontiac and one in Chelsea, Mich., all Flanders enterprises, which were amalgamated under the style Flanders Mfg. Co., about a year ago. They comprised a motorcycle plant, which later took up electric cars also; a foundry, a gear works, a drop forge plant and a screw machine factory.

Gilson Retires from Mitchell Company.

James W. Gilson, for the past three years general sales manager of the Mitchell-Lewis Motor Co., of Racine, Wis., who last year was made a director of the company, has resigned both offices, but has not made known his plans for the future. As for many years he was representative for the Hartford Rubber Works Company, it will not excite surprise if he re-enters the tire trade. Some two months since the directorate of the Mitchell-Lewis Co. was enlarged to permit the entry of six Western bankers into the affairs of the company and it is understood that they have instituted a number of far-reaching reforms.

Engraver Purchases Great Smith Plant.

After several false alarms and several abortive efforts to effect a reorganization, the assets of the Smith Automobile Co., of Topeka, Kans., have been purchased by C. A. Southwick, proprietor of the Topeka Engraving Co., who will reopen the plant and recommence the production of automobiles. The Smith company, which built a few hundred Great Smith cars, failed several months ago, since which time the factory has remained idle.

Jacobson-Brandow is Short-Circuited.

The Jacobson-Brandow Co., of Pittsfield, Mass., manufacturer of magnetos and other ignition specialties, has been petitioned into involuntary bankruptcy at the instance of two creditors whose claims aggregate \$4,624. The petition grew out of an assignment made for the benefit of the creditors on December 28, to Henry G. Tucker. The liabilities are given as \$30,000; the assets are small.

CLIFTON AGAIN SUCCEEDS HIMSELF

Is Re-elected President of Board of Trade Together With All Other Officers—Who's Who in the Committees.

Charles Clifton, of the Pierce-Arrow Motor Car Co., of Buffalo, N. Y., will remain at the head of the Automobile Board of Trade for another twelve-month. He was elected to succeed himself at the annual meeting of that organization, which occurred in New York, on Tuesday last, 9th inst. He so often and so regularly had been elected to the presidency of the Association of Licensed Automobile Manufacturers, which the Board of Trade supplanted, that his unanimous re-election each year has become almost a matter of course. They think well of him in the Board of Trade, and not without reason. As a matter of fact, they esteem all their officers so highly that each of them was unanimously returned to office for another year. Besides Mr. Clifton, they are as follows:

Vice-president, C. C. Hanch, Nordyke & Marmon Co.; secretary, Benjamin Briscoe, United States Motor Co.; treasurer, George Pope, Pope Mfg. Co.; directors, Charles Clifton, Benjamin Briscoe, C. C. Hanch, S. D. Waldon, Packard Motor Car Co.; Hugh Chalmers, Chalmers Motor Co.; W. C. Leland, Cadillac Motor Car Co.; S. T. Davis, Jr., Locomobile Co., of America. H. A. Bunnell was continued as general manager.

All of the working committees of the Board of Trade also were re-appointed in their entirety, as follows:

Patents: C. C. Hanch, W. H. Van Dervoort, L. H. Kittredge, L. E. Latta, A. Macauley.

Trade: H. O. Smith, E. R. Benson, W. E. Metzger, C. W. Churchill, W. T. White.

Statistical: Benjamin Briscoe, E. P. Chalfant, J. S. Clarke.

Show: George Pope, Alfred Reeves, M. L. Downs.

Legislation and Law: G. H. Stilwell, Albert L. Pope.

Interchange and Arbitration: G. E. Daniels, W. C. Shepherd, J. W. Gilson.

Good Roads: R. D. Chapin, S. D. Waldon, J. N. Willys.

Publicity: Alfred Reeves, E. R. Estep, H. W. Ford.

Mechanical Co-operation: A. L. Riker, D. Ferguson, F. B. Stearns, C. W. Nash, H. E. Coffin.

The annual meeting was a short one and lasted only about one hour. Apart from the election the time was consumed largely in the rendering of the annual reports by the several committees. The only thing not of a routine nature was the announcement that the International Motor Co. had qualified for membership and had been added to the roll. The International company is the same which recently assumed control of the Mack and Sauer truck companies.

M. A. M. Re-elects Three of Four Directors.

At the annual meeting of the Motor and Accessory Manufacturers Inc. which occurred in New York on Tuesday last, 10th inst., the only business not of a routine nature was the election of four three-year directors. Only one new man entered the board, however, as H. T. Dunn, Fisk Rubber Co.; L. M. Wainwright, Diamond Chain & Mfg. Co., and E. S. Fretz, Light Mfg. & Foundry Co., were elected to succeed themselves for another term of three years. F. E. Castle of the Castle Lamp Co., was the director who retired; he was succeeded by F. C. Billings of the Billings & Spencer Co. The report of the treasurer showed the organization to be in good condition with something like \$80,000 in its strong box. The annual general meeting at which the election of officers will occur will take place to-morrow (Friday) morning. It is practically certain that H. T. Dunn will be re-elected president and that most of the other officers will be retained in office for another year.

Avery Sells Rights to Electrobola Lamps.

The Garage Equipment Mfg. Co., of which G. F. Discher is president and manager, has acquired from the Avery Portable Light Co., of that city, the rights to the Electrobola electric lamps and will continue their manufacture and sale. The Electrobola productions are distinguished because of the fact that they are formed of one solid aluminum casting, the reflecting surface being accurately ground and highly polished; it is claimed to be untarnishable.

Sale of Parker Motor Plant Effected.

The Henry & Wright Mfg. Co., of Hartford, Conn., has consummated the purchase of the bankrupt plant of the Parker Motor Co. in that city and will take possession about March 1st. The new owners, however, will not continue the manufacture of motors, but will devote the plant to the production of their ball bearing drilling machines.

THE MOTOR WORLD

ARGUMENT IN WESTEN APPEAL

Shock Absorber Patent Litigation Reaches Court of Appeals—Brush Runabout Settlement an Influential Factor.

In the United States Circuit Court of Appeals in Philadelphia, argument was heard on Friday last, 5th inst., on the appeal of the Westen Mfg. Co., of Trenton, N. J., from the decision of the lower court which held that the Westen shock absorber is an infringement on the Truffault-Hartford patents.

The appeal was, of course, the outcome of the decision rendered against the Westen company in one of the series of suits filed by the Hartford Suspension Company which controls the Truffault-Hartford rights, but the present proceedings are of more than usual interest, as it is the first time that the patents involved have reached the Court of Appeals. The decision is not expected for several weeks.

Several days before the decision adverse to the Westen shock absorber was rendered in the United States District Court for the Southern District of Pennsylvania, the United States Circuit Court for the Southern District of New York, in a similar suit brought by the Hartford Suspension Co. against the New York agents for the Brush runabout, held that the suspension employed on the latter car was an infringement of the Truffault-Hartford patent. The Brush Runabout Co. itself defended that action, and when an unfavorable decision was rendered it prepared an appeal, but before it was filed an amicable settlement was reached with the Hartford Suspension Co., whereby the Brush runabout was permitted to continue to employ its absorbing spring suspension under license from the Hartford company.

As the Federal court in Pennsylvania heard no evidence in the suit against the Westen company and accepted as its decision the decision of the Federal court in New York, the Westen company was prepared to await the result of the Brush appeal, but when the Brush settlement with the patent owners made that appeal unnecessary, the Westen people took up the fight and carried it to the higher court. With what result shortly will be made plain.

Brooklyn Engine Builders Take Up Trucks.

The Powell Engine Corporation, which has been building automobile and marine motors at 47-49 Lincoln place, Brooklyn, N. Y., has taken up truck manufacture. Its vehicles will be of 1½ and 2 tons capacity and will employ a Brownell unit power plant of 25 horsepower. It will be chain driven and will employ a Bosch high tension magneto, Schebler carburetter, multiple disk clutch, gear pump and splash lu-

brication, centrifugal water pump and Timken axle. The radiator will be a special type developed by the Powell Corporation itself.

Eisemann Transfers Its Sales Department.

Because of the desirability of having it located nearer to the factory, which is in Brooklyn, N. Y., the sales department of the Eisemann Magneto Co., which heretofore has been maintained in Detroit, has been transferred to and consolidated with the main office of the company at 225-227 West 57th street, New York. Simultaneously A. T. Le Blanc, an old Eisemann attache, has been appointed sales manager. The Detroit establishment will be continued as a branch office, and will remain in charge of H. D. Wilson. The Eisemann company also has opened a branch in Indianapolis, at 427 Meriden street in charge of Lon R. Smith.

Bankrupt Importers File Their Schedules.

Schedules in bankruptcy of the Zust Motor Co., of New York City, show the liabilities to be \$37,894, and assets \$37,231, the latter consisting of cars, machinery, etc., \$31,237; accounts, \$5,992 and cash, \$2. Of the liabilities \$19,879 is accommodation paper held by the Ohio Motor Car Co., of Cincinnati, Ohio, and the estate of Jacob Weidman, of Paterson, N. J.

Croxton Would Go West For \$100,000.

The Croxton Motor Co., of Cleveland, O., is seeking a site further West and has offered to remove to Atchison, Kans., if the residents of that bustling place will tempt it to the extent of \$100,000. The temptation is not yet in plain sight, but it is stated that the industrial commissioner of the Union Pacific Railway is trying to find a site for the company.

Acorn Finds New Plant in Aurora.

The Acorn Brass Mfg. Co. has removed from Chicago to Aurora, Ill., where it has become possessed of a new and modern factory affording 60,000 square feet of floor space. It will permit a considerably increased output of Acorn castings and gasolene storage outfits.

Case Increases Capital to \$40,000,000.

J. I. Case Threshing Machine Co., of Racine, Wis., which manufactures the Case car, has increased its capital stock from \$5,000,000 to \$40,000,000. The added capital will be used in extending the company's business, several new lines of manufacture being in prospect.

Roser Admits His Son to Partnership.

Hermann Roser, of Glastonbury, Conn., who makes a specialty of producing pigskin leather for the automobile trade, has admitted his son, John H., to partnership. Hereafter the firm name will be Hermann Roser & Son.

DYER PERSUADES PRIVATE OWNERS

His "Investigators" Collect \$25 License Fees from Users of "Infringing" Cars—Wholesale Litigation is Costly.

In addition to suing "everyone who manufactures automobiles," to quote their own statement, it transpires that Dyer, Dyer & Taylor, the New York law firm, which is exploiting the two Dyer patents which, it is claimed, are being infringed by practically all the sliding gears now in use, are proceeding also against the actual owners and users of cars which are held to violate the patents.

As was stated in the Motor World of December 28th, suits already have been instituted against the Palmer & Singer Mfg. Co., the Winton Motor Carriage Co. and the Maxwell-Briscoe Motor Co., but so far as known no actions yet have been filed against car owners. The Dyer policy appears to be to seek out the latter and by methods of persuasion, or otherwise, to convince them of the "error of their way"—and the validity of the Dyer patents. There is no means of estimating the number of owners who have been so "convinced," but during the course of a few minutes which a Motor World representative spent in the Dyer law office several days since, two checks of \$25 each were turned in by men whom Mr. Dyer described as his "investigators." He exhibited the checks with a show of pride and it was on that occasion that it became known for the first time that car owners were being proceeded against, by persuasive methods at least. At the time Mr. Dyer stated that no further suits had been instituted against manufacturers and remarked that such litigation was "exceedingly expensive," conveying the inference that the promise to "sue everyone who manufactures automobiles" is such a tall order that it is not likely to be fulfilled. Apparently the employment of "investigators" to seek out car owners involves less outlay. The two patents involved, as fairly well known, are Nos. 885,986 and 921,863, both issued to Leonard H. Dyer, who now is a resident of Greenwich, Conn.

Durocar, Amalgamated, Obtains New Plant.

As the result of the efforts of the Durocar Mfg. Co., of Los Angeles, to obtain new capital and a new factory, there has been organized in that city the Amalgamated Motor Co., which will remove the Durocar plant from Los Angeles to Santa Ana, Cal., where a concrete factory building will be erected immediately. It will have a capacity for 1,000 automobiles per year. At the present time the Durocar company is making pleasure cars only, but when removal is effected and the Amalgamated Motor Co. takes full possession, the

production of trucks will be taken up also. The Merchants and Manufacturers' Association and the Chamber of Commerce of Santa Ana largely were responsible for bringing about the transaction.

Willis and Hamilton Out of Kokomo.

F. I. Willis, of the Hearsey-Willis Co., Indianapolis, and G. H. Hamilton, of the Continental Rubber Works, Erie, Pa., who only three months ago acquired an interest in the Kokomo Rubber Co., of Kokomo, Ind., have sold their holdings to the Spraker interests, which organized and controlled the company, from which both Willis and Hamilton have retired. Willis relinquished the vice-presidency and will now devote himself wholly to the Hearsey-Willis Co., while Hamilton, who served as the Kokomo sales manager, will join the Federal Rubber Mfg. Co., in Milwaukee, Wis., in which he will assume the duties of assistant sales manager. The Federal company is composed almost wholly of former G & J tire men, and as, previous to his connection with the Continental Rubber Works, Hamilton was one of the number, he will not be strange to his new surroundings.

Cigarette Destroys a Winnipeg Garage.

Fire on Thursday last, 4th inst., totally destroyed the Excelsior Motor Works and Garage in Winnipeg, Manitoba. The conflagration was a stubborn one and before it was subdued it destroyed not only the garage and 25 automobiles but several stores and other buildings. The total loss is placed at \$200,000. The blaze was caused by a smoker's carelessness with his lighted cigarette.

Cameron Company in Financial Hot Water.

The Cameron Car Co., of Beverly, Mass., which manufactured the Cameron car, is in financial straits. Its creditors have filed a petition in bankruptcy, but the company is opposing the petition and also receivership proceedings which are threatened. In addition to the factory in Beverly, the Cameron company also maintains a plant in Attica, Ind.

Mosler Takes Up Odometer Manufacture.

A. R. Mosler & Co., of New York, who are widely known as manufacturers of the Spitfire spark plug, are branching into other lines of manufacture. Only recently they took up the production of a novel anti-skid device, and now have in hand a hub odometer, which shortly will be ready for the market.

Invincible Starter Locates in Detroit.

D. W. Reinhold, who previously was connected with the Prest-O-Lite Co., of Indianapolis, has organized the Invincible Starter Co. in Detroit, Mich., and is producing the Invincible engine starter, which is of the acetylene type. It is Reinhold's invention and lists at \$25.

SAYS CONTRACT WAS ONE-SIDED

Court of Appeals Decides in Favor of Milwaukee Dealer—Echo of Velie's Conspiracy Charge Against A. L. A. M.

Contracts with dealers in which manufacturers reserve to themselves the right of cancellation without giving the other parties to the agreement a similar right, are without force and effect, is the substance of the decision of the United States Circuit Court of Appeals for the Seventh District, which sits in Chicago. This far-reaching decision was rendered last week by Judges Baker, Seaman and Kohlsaat, who comprised the Court, in the more or less famous suit for breach of contract brought by the Velie Motor Car Co., of Moline, Ill., against the Kopmeier Motor Car Co., of Milwaukee, Wis., which was a part of the Velie company's sensational onslaught on the individual members of the Association of Licensed Automobile Manufacturers.

Each of the 56 members of the association was accused of conspiracy, and damages to the extent of \$500,000 were asked in each instance. The litigation was instituted in the Wisconsin Supreme Court, and although several steps were taken and a bitterly fought contest was in sight, nothing very definite has evolved, and it was generally understood the case would be permitted to die a peaceful death, the Selden patent, around which the A. L. A. M. was built, having been declared invalid since the Velie proceedings were instituted. The complaint charged that the A. L. A. M. was a conspiracy and a combination in restraint of trade, and as further evidence of conspiracy it was alleged that the Kopmeier Motor Car Co., which handled the Velie car in Milwaukee, had been induced to break its contract with the plaintiff and restrained from exhibiting and selling Velie cars.

While the conspiracy issue has been permitted to slumber, the Kopmeier case was pressed to a conclusion. When tried before Judge Quarles, in the United States Court for the Eastern District of Wisconsin, he sustained the demurrer interposed by the Kopmeier defense. He discussed the contract between Velie and Kopmeier at considerable length. It was of the character usual in the automobile business, and for a consideration of \$1.00 conveyed to the Milwaukee dealers exclusive right of sale in a specified territory, the dealers agreeing to deposit \$1,000 and to honor sight draft attached to bill of lading. The contract covered 50 cars, which were to be invoiced at stated prices. It concluded with the following stipulation: "This agreement expires by limitation the 31st day of October, 1910, the party of the first part (Velie) having the right to return deposits

and cancel this contract, and a letter written by them to the party of the second part (Kopmeier) shall be sufficient notice."

In sustaining the demurrer, Judge Quarles said "that the plaintiff having reserved to itself by the terms of the contract the right to cancel the contract at its pleasure, the corresponding right arose in the behalf of the defendant" and "this right to cancel the contract arbitrarily conferred upon the plaintiff, destroys the mutuality whether the contract be one of sale or agency." The court added that the "conclusion is irresistible" that the agreement was "in essence an agency contract" in which the defendant agreed "to handle Velie automobiles under certain conditions" and ruled that the limitations and restrictions of the agreement were "inconsistent with the dominion conferred by actual sale." The term "handle," he said, "involves a suitable garage and equipment to keep a Velie car for the purpose of demonstration, sale and repair."

The point which decided Judge Quarles, however, was the rule which he remarked is well established, that in order to bind the defendant the plaintiff must also be bound by like conditions in a contract. As the Velie contract was one-sided in this regard, he ruled that it was unnecessary to consider other points which had been raised and held that the one-sidedness of the contract was fatal to the plaintiff's contention. He accordingly sustained the demurrer. But the Velie company was not content and carried the case to the United States Circuit Court of Appeals for the Seventh District, which, as stated, last week upheld the decision of Judge Quarles, who meanwhile had been gathered to his fathers.

"Burial" of A. L. A. M. Authorized.

While for all practical purposes the Association of Licensed Automobile Manufacturers "died" at least six months ago, its formal dissolution and burial has not yet occurred. This, however, was authorized at the annual meeting of the "remains" which occurred in New York yesterday. The officers now will proceed to wind up the association and it is not likely that another meeting of any sort will be held. Charles Clifton, for seven years president of the A. L. A. M., having rendered his final report and received the thanks of the members, which also were extended to the other officers and the executive committee.

Phillips' Injunction is Made Permanent.

Henry Phillips, who operates as the H. Phillips Rubber Works, in New York City, against whom the United States Circuit Court for the Southern District of New York, on December 18th last, issued a preliminary injunction, restraining him from selling or in any way infringing the Klaxon rights, has seen the error of his way and accordingly consented that the injunction be made permanent. The permanent in-

junction was signed by Judge Hough on Saturday last, 4th inst. The proceedings against Phillips were, of course, instituted by the Lovell-McConnell Mfg. Co., of Newark, N. J., and grew out of the fact that Phillips had made free with the price of Klaxon horns in violation of the conditional license under which they are sold.

Changes Among Prominent Tradesmen.

Lathrop Collins, formerly Michigan agent for the Marmon car, has joined the King Motor Car Co., of Detroit. He will manage its service department.

F. E. Van Patton has been appointed manager of the branch which the Ford Motor Co. just has opened in Louisville, Ky. Previously he was assistant manager of the Ford branch in Cleveland.

Marcus Allen has been appointed manager of the branch which the Federal Rubber Mfg. Co., of Milwaukee, just has established in New York City. Allen previously was the manager of the G & J tire branch in the metropolis.

Norman P. Druck has been appointed manager of the Packard branch in Trenton, N. J., which controls a considerable slice of territory in both New Jersey and Pennsylvania. Druck was identified with the Stoddard-Dayton agency in Trenton.

Wm. M. Gage has been appointed sales manager for the Colt-Stratton Co., of New York. Eastern distributors of Cole cars. Gage was a prominent figure in the New York trade until about a year ago, when he became manager of the United States Hotel in Saratoga, N. Y.

Henry G. Stoddard has been elected vice-president and general sales manager for the Wyman & Gordon Co., of Worcester, Mass. Previously he was president of the Trenton Iron Co., of Trenton, N. J., and had served also as manager of the Worcester branch of the American Steel & Wire Co.

Myron Townsend, a former Western newspaper man, has been appointed assistant advertising manager for the Timken Roller Bearing Co., of Canton, O., and the Timken-Detroit Axle Co., of Detroit. He will make his headquarters at Canton, while Edwin A. Walton, advertising manager for the twin companies, will remain in Detroit.

Truck and Tire Sellers Get Together.

As the outcome of a meeting of motor truck dealers and tire company managers, held last week in the Copley Square Hotel, Boston, Mass., it is probable that a permanent Motor Truck and Tire Board of Trade will be formed. The purpose of the embryo organization is "to assist the buyer and user of motor trucks, to give sound advice to prospective customers and users, and to improve the selling end of the business, by eliminating the unsound methods that are sometimes used." H. L. Stockbridge, of the Polack Tyre Co., was elected

temporary chairman, and Day Baker, New England manager of the General Vehicle Co., was elected secretary. A committee composed of George H. Hudson, of the Alco; N. F. H. Saunders, of the DeDion, and Day Baker, of the General Vehicle Co., was appointed to present by-laws and recommendations with reference to permanent organization.

Fenner Heads New York's Truck Club.

At its annual meeting on Thursday last, 4th inst., the Motor Truck Club of New York elected the following officers for the ensuing year: President, D. C. Fenner (International Motors Co.); vice-president, Emerson Brooks (Remington Standard Motor Co.); secretary and treasurer, Charles E. Stone (Hexter Motor Co.); managerial board, F. B. Porter (Chase Motor Co.); E. Lascaris (De Dion-Bouton); E. O. Hoopengartner (Swinehart Tire Co.); A. N. Bingham (Metzger Motor Co.); E. W. Curtis, Jr. (General Vehicle Co.); A. J. Slade (consulting engineer), and John Hanson Kennard (Couple Gear Co.)

Matheson Boston Agency Bankrupt.

An involuntary petition in bankruptcy has been filed against the Matheson Co. of Boston, by George H. Chandler, of Mansfield, Mass., who holds a claim against the company amounting to \$7,794.90, for which he has secured a judgment. In his petition Chandler charges that the company has concealed several automobiles by transfer to one Freeman N. Young, with intent to hinder, delay, or defraud the creditors, and also that the accounts receivable were conveyed to the Matheson Automobile Co. of New York City.

Colonial "Read" Shrouded in Mystery.

The Colonial Engineering Co., of Montreal, Canada, which gives No. 282 St. Catherine street, West, as its address, is by mail seeking agents in the Dominion for the "Read Six-45," a six-cylinder, five-passenger car which is stated will be sold for "about \$2,500." The company would have it believed that the car will be ready for the market early this year but not a great deal appears to be known of either the car or the men comprising the company.

Stearns to Sell the Banner Output.

E. G. Stearns and W. H. Buritt, who own the Banner Rubber Co., of St. Louis, have organized and incorporated the Stearns Rubber Co., which will sell the output of the Banner Company, tires being among the productions. The company will do business at West Jackson Boulevard and South Market street, St. Louis. Stearns is president of the company, Buritt, vice-president and W. F. Rath, secretary-treasurer.

Krit Company Doubles Its Capital.

The Krit Motor Car Co., of Detroit, has increased its capital from \$250,000 to \$500,000.



B. Williams is erecting a garage at Colville, Wash. He will handle the Rambler line.

Porter & Smith are building a garage at Walhalla, N. D.; they will establish a renting and repair service.

A new salesroom and garage has been opened in Urich, Mo., by Robert McCoy, who will sell Cole cars.

Charles Hewlett is building a garage on Broadway, Far Rockaway, L. I. It will represent an investment of \$7,000.

M. F. Prochaska is erecting a garage at present in LeCoeur, Minn. It will be managed by his son, Raymond Prochasta.

Sylvester Seymour has broken ground for a garage at Little Falls, N. Y. It will be one story high, of concrete blocks, 36 x 58 feet.

L. J. Boyler is building a brick garage at Seguin, Tex. It will be 25 x 100 feet, and will be known under the style the Seguin Auto & Cycle Co.

The Bethel Garage & Plumbing Co. is the style of a new company which just has been formed at South Norwalk, Conn. It is capitalized at \$2,000.

H. W. Gehr and A. C. Lifquist have formed a partnership and opened a garage in Wadena, Minn. They will conduct a livery business and do repairing.

F. T. Bradley has broken ground for a brick garage at the corner of Prospect and Highland streets, New Haven, Conn. It will cost, when complete, \$2,000.

Skinner & Elliott, who for some time have operated a garage in Sacramento, Ca., have taken up the sale of pleasure cars. They will handle the Pope-Hartford line.

T. A. Koppang and O. S. Jordet have formed a partnership and opened a garage in Kalispell, Mont. They will operate under the style the Koppang-Jordet Motor Co.

The Comstock Motor Sales Co. has been formed at Mason City, with a capital of \$25,000, and M. E. Comstock as general manager. The company will handle Rambler cars exclusively.

The Thornton-Fuller Automobile Co., which recently was organized in Philadelphia, Pa., has taken the agency for Simplex cars for the eastern part of Pennsylvania and southern New Jersey.

The Congress Automobile Garage is the style of a new establishment which just has been opened at Cohoes, N. Y. Conrad Peitner is the manager; the other owners being Clement Palin and Fred Sternberg.

The Oriental Rubber Co., of 1170 Bed-

ford avenue, Brooklyn, N. Y., which deals in the products of the United States Tire Co., has changed its name; hereafter it will do business as the Oriental Rubber & Supply Co.

The C. A. R. Motor Co., which last week was incorporated at Plainfield, N. J., with \$60,000 capital, has taken over the business of Oliver A. Reed. The company will continue the former general sales and garage business.

James A. Quinn, a dealer in rubber tires, at 76 West 85th street, New York City, has filed a petition in bankruptcy, with liabilities of \$1,373 and no assets. Among the creditors are Morgan & Wright, (\$1,092), and the Federal Rubber Co. (\$180).

The Winton Motor Car Co. has secured a ten-year lease on the premises at Race and Twelfth streets, Cincinnati, Ohio, to which address the Winton branch will be removed about March 1st. Meanwhile the building, which is 75 x 95 feet, will be considerably improved.

S. McChesney, of Lewistown, Mont., who does business under the style Mack's Auto Hospital, has erected a new garage, 62 x 112 feet, on First avenue. In addition to general repairing and garage work he handles the Reo and Glide pleasure cars and the Avery tractor.

James L. Gillingham has been appointed receiver of the Boston Kissel Kar Co. George W. Coleman, who formerly was bookkeeper of the National Bank of Cambridge, Mass., and who is now serving a prison sentence for complicity in wrecking that institution, was president of the Kissel Kar Co., of Boston, before his arrest.

W. H. Mendel, Jr., formerly sales manager of Rothschild & Co., and Robert Rothheim, have formed a partnership and opened salesrooms at 1789 Broadway, New York City, where they will trade under the style Dealers' Auto Exchange. They hope to make a specialty of disposing of second-hand cars taken in trade by the factory branches in New York.

Numerals Dropped to Avoid Confusion.

Following the example of other manufacturers in simplifying the designation of their products, the Cole Motor Car Co., Indianapolis, Ind., has dropped the numerals "30" and "30-40" as heretofore appended to the name Cole. In dropping the figures it is explained that while they were of value as indicating the horsepower of the two models produced they tended rather to cause confusion.

Now the Excelsior Liquidation Company.

The Excelsior Motor & Mfg. Co., of Chicago, which made the Excelsior motor, and the Excelsior Supply Co., which conducted an immense automobile supply business, have changed their names to the Excelsior Liquidation Co. Both the motor company and the supply company failed for a large amount several months since.



Lynn, Mass.—The Automobile Omnibus Co., under Missouri laws, with \$10,000 capital. Corporators—Eben B. Phillips, Patrice D. Theriault, and James J. Liffin.

Columbus, Ohio—E-M-F and Flanders Sales Co., under Ohio laws, with \$10,000 capital; to deal in automobiles. Corporators—George E. Thomas and others.

Swampscott, Mass.—E. L. Brown Automobile Co., under Massachusetts laws, with \$25,000 capital. Corporators—Edwin L. Brown, Martin H. Randall, and James D. Bee.

Philadelphia, Pa.—Gibney Motor Supply Co., under Pennsylvania laws, with \$50,000 capital; to deal in automobiles and accessories. Corporators—Thomas G. Golden and others.

Evansville, Ind.—Columbia Taxicab Co., under the laws of Indiana, with a capital of \$10,000; to operate taxicabs. Corporators H. E. Hulsman, Walter Wheeler, and A. C. Mathias.

Indianapolis, Ind.—Motor Accessories Co., under Indiana laws, with \$20,000 capital; to deal in automobiles and accessories. Corporators—C. L. Paine, Lucile H. Paine, Hattie M. Paine.

Mason City, Iowa—Comstock Motor Sales Co., under Iowa laws, with \$25,000 capital; to do a general automobile selling agent business. Corporators—M. E. Comstock and others.

Utica, N. Y.—Crim-Bronner Auto Company, under New York laws, with \$5,000 capital. Corporators—Howard D. Crim, Nellis B. Bronner, Chas. W. Crim, and Myron G. Bronner.

Independence, Iowa—Meyer-Koch Auto Co., under Iowa laws, with a capital of \$10,000; to deal in automobiles and accessories. Corporators—H. J. Wilson, William H. Koch, O. G. Meyer.

Bridgewater, Mass.—William H. Bassett Co., under Massachusetts laws, with \$20,000 capital; to deal in automobiles. Corporators—J. Gardner Bassett, William H. Bassett, E. A. McMaster.

St. Louis, Mo.—American Motor Sales Co., under Missouri laws, with \$5,000 capital; to deal in motor cars and supplies. Corporators—Clem T. Strauss, Freen B. Nulsen, C. W. Waughop.

Detroit, Mich.—Hunter Auto Lock Co., under Michigan laws, with \$20,000 capital; to manufacture automobile locks. Corporators—George E. Eckert, John F. McHugh and Mable E. Griffith.

Bethel, Conn.—Bethel Garage and Plumbing Co., under Connecticut laws, with a capital of \$2,825; to do a general garage business. Corporators—Ernest L.

Taylor, Charles G. Anderson, Robert Hal-laran, Herbert Leid, Frederick Kirk and Charles Moore.

Cleveland, Ohio—Koepe Motor Sales Co., under the laws of Ohio, with a capital of \$30,000; to deal in motor cars and accessories. Corporators—John C. Koepe, Edmund C. Hasel, and others.

Minot, N. D.—Minot Automobile Co., under the laws of North Dakota, with a capital of \$20,000; to do a general automobile business. Corporators—Ardor E. Javenger, Lewis C. Sterns, and others.

Brooklyn, N. Y.—Central Motor Co., under New York laws, with \$10,000 capital; to manufacture automobile motors and machinery. Corporators—Ralph Dubecq, Arthur M. Beres, William H. Barradell.

Cleveland, Ohio—The Weger Motor Co., under Ohio laws, with \$100,000 capital; to manufacture automobile motors. Corporators—E. C. Rock, J. B. Seymour, E. A. Williamson, F. M. Lamoreaux, and J. P. Updyke.

Boston, Mass.—Orrin Bay, Inc., under Massachusetts laws, with \$50,000 capital; to deal in automobiles and accessories. Corporators—Orrin Bay, Somerville; Willis N. Tuller, Boston; Alfred R. Grindule, Worcester.

Boston, Mass.—The Automobile Horn and Pump Co., under Massachusetts laws, with \$25,000 capital; to manufacture automobile horns and pumps. Corporators—Joseph Payne, Anthony J. San, Antoni Dubrawski.

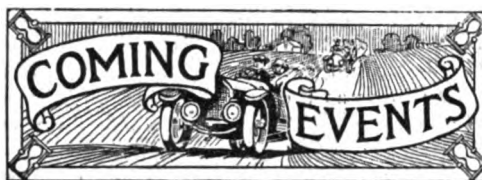
Fort Madison, Iowa—Auto Supply and Engine Co., under Iowa laws, with \$30,000 capital; to do a general garage business. Corporators—E. Corsepis, T. P. Hallowell, George B. Stewart, W. A. Scherfe, A. B. Garrott.

Los Angeles, Cal.—White Garage and Motor Co., under California laws, with \$100,000 capital; to do a general garage business. Corporators—L. J. Merritt, R. R. Hanan, R. R. Sibley, F. F. Sibley, Vincent Morgan.

New York, N. Y.—The American Elastic Wheel Co., under New York laws with a \$50,000 capital; to manufacture automobile parts and accessories. Corporators—C. Feroc, Rome, Italy; F. Corsi, F. P. Ward, New York.

Cleveland, Ohio—Cleveland Transfer Auto Livery and Baggage Co., under Ohio laws, with \$5,000 capital; to do general livery and express business. Corporators—Moses Brailey, Florence B. Brailey, G. H. Knippenberg, Edward Kirkland and James E. Mathews.

Cleveland, Ohio—Eckenroth Automobile Livery Co., under the laws of Ohio, with \$5,000 capital; to build and repair automobiles. Corporators—Rudolph H. Eckenroth, Harry J. Eckenroth, Peter L. Eckenroth, Carlton F. Schultz, and Hazel C. Eckenroth.



January 6-13, New York City—Automobile Board of Trade's 12th annual show in Madison Square Garden. Pleasure vehicles only.

January 10, New York City, N. Y.—Motor and Accessory Manufacturers annual meeting.

January 10-13, Peoria, Ill.—Peoria Automobile Club's show in the Coliseum.

January 10-17, New York City—National Association of Automobile Manufacturers' 12th annual national show in New Grand Central palace. Pleasure and commercial vehicles.

January 11, New York City, N. Y.—Motor and Accessory Manufacturers annual banquet at Waldorf-Astoria.

January 13-19, Milwaukee, Wis.—Milwaukee Automobile Dealers' Association's annual show in Auditorium.

January 13-27, Philadelphia, Pa.—Philadelphia Automobile Trade Association's annual show in First and Third Regiment Armories.

January 15-20, Toledo, Ohio—Toledo Automobile Dealers' Association's annual show in Terminal Railway Building.

January 15-20, New York City—Automobile Board of Trade's 12th annual national show in Madison Square Garden. Commercial vehicles only.

January 18-20, New York City—Annual meeting of the Society of Automobile Engineers.

January 22-27, Providence, R. I.—Rhode Island Licensed Automobile Dealers' Association's show in the State Armory.

January 22-27, Rochester, N. Y.—Rochester Automobile Dealers' show in State Armory.

January 22-29, Detroit, Mich.—Detroit Automobile Dealers' Association's annual show at Wayne Garden.

January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

January 29-February 3, Scranton, Pa.—Second annual automobile show in 13th Regiment Armory.

February 1-7, Washington, D. C.—Annual show in Convention Hall.

February 3-10, Montreal, Can.—Automobile Club of Canada's annual show at Drill Hall.

February 3-10, Harrisburg, Pa.—Harrisburg Automobile Dealers' Association's third annual show in Harrisburg Arena.

February 5-10, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of commercial vehicles.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

February 5-17, St. Louis, Mo.—Annual show in the Coliseum.

February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.

February 14-17, Grand Rapids, Mich.—Third annual show.

February 17-24, Cleveland, Ohio—Cleveland Automobile Show Company's annual show in Central Armory.

February 17-24, Newark, N. J.—New Jersey Automobile Exhibition Co.'s annual show in First Regiment Armory.

February 17-24, Minneapolis, Minn.—Minneapolis Automobile Show Association's annual display at National Guard Armory and Coliseum.

February 19-24, Omaha, Neb.—Omaha Automobile Association's annual show in the Auditorium.

February 19-24, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show of pleasure cars in Music Hall.

February 19-24, Hartford, Conn.—Hartford Automobile Dealers' Association's show in the State Armory.

February, 20-24, Poughkeepsie, N. Y.—Annual show in the State Armory.

February 20-28, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in Fifth Regiment Armory.

February 21-28, Toronto, Can.—Toronto Automobile Trade Association's annual annual show in the Armory.

February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.

February 26-March 2, Paterson, N. J.—Paterson Automobile Trade Association's annual show in Fifth Regiment Armory.



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NEED FOR DISTINGUISHMENT OF BODY TYPES.

Despite the fact that the industry has cut its eye-teeth and is near to the years of discretion, the shows now in progress in New York serve to emphasize the fact that even at this late day it is difficult to discover where particular types of car begin and where others end.

As an example, the line of distinction between the runabout and the roadster types, which never was very well defined, is, if anything, more befogged than ever. It is generally agreed that both are two-passenger open cars but there general agreement ends. Size or weight, or both, usually are considered the determining factors; but runabouts are much larger than they used to be and since their equipment with doors they look more like roadsters than ever they did.

Similarly, certain types of limousines or near-limousines are being confused with coupes, or vice versa, until it is well nigh impossible to distinguish between the two types, and to make matters worse, none is competent to say what constitutes the so-called Berline or at exactly what point the ordinary limousine begins to encroach on it. But worst of all is the recent and growing tendency to designate a plain touring car structure a phaeton, which it resembles not at all.

The reason for it is hard to find. At least some of the men engaged in the sale of "phaetons" frankly admit that they do not know wherein they differ from touring cars; and certainly the differences, if any exist, are not readily observable to even the practiced eye. But the very term "touring car" contains and conveys suggestions of such commercial and general value that it will

be regrettable indeed to confound the situation and lessen the value of the older and established designation.

While it probably is too much to expect that anything of the sort will come to pass, it would serve many good purposes did one or the other of the trade organizations take the matter in hand and clearly define the several types, so that all may understand.

FOR THE SAFEGUARDING OF EXPORT TRADE.

It would seem that an element of that self-preservation which is the first law of nature ought to inspire nearly every man engaged in business to throw around his possessions as many safeguards as the law and his means permit.

That very many are sadly lacking in this regard, the daily records of the courts serve to indicate. Much of it is understandable and some of the deficiencies are excusable. It is human nature to take too much for granted, which inclination is the underlying cause of not a little of the mischief that besets commercial life. For instance, few men expect their own names, or brand names which they may employ, to be stolen.

Comparatively few persons go to the trouble of registering such names as trademarks. Inquiry probably would disclose that not half of the well known trade names associated with the automobile industry are thus protected even at home, while the idea of protecting them abroad rarely suggests itself until something serious occurs. But now that American automobile manufacturers are reaching into the four corners of the world for business and planting their names far afield, the unpleasant and expensive experiences of some of their fellows should assist in convincing them that it is the better part of wisdom to protect their trade names in all those countries in which the volume of business justifies it or seems likely to justify it.

Within a comparatively recent period, at least three manufacturers identified with the automobile industry were rudely awakened from three different directions, as widely separated as Japan and South America, by the discovery that their trade names had been seized upon and registered by others and that perforce they could not sell their own wares under their own names. In two of the three instances, expensive litigation was necessary before the name was "bought off" for a handsome sum.

If a name is worth anything it is worth protecting and the manufacturer who is engaged or engaging in export trade should not remain insensible of the fact.

POSITION OF THE STARTING CRANK.

With due credit for the excellence of the advice, it must be apparent to even the casual observer that to start a motor by a "straight pull up" on the crank is impossible except in very few cases. Just why the average crank should be virtually on a "dead center" when it really should be in a position to permit of the suggested "straight pull up" is not quite clear. It scarcely is necessary to point out that if the crank were so arranged as to be slightly off the center when in the normal starting position, the advice could be followed literally and the operation would be infinitely simpler and easier. Though the starting crank probably is doomed, it is likely to be a long time before it disappears entirely, and in the meantime it is meet that it should be improved. And there really is no reason why it should not be improved, when it merely requires that the engaging mechanism be shifted around a fraction of an inch.

PALACE SHOW OPENED WITH SONG

One Hundred Male Singers Raise Their Voices as Invited Guests Arrive—The Cars and Trucks Exhibited.

To the accompaniment of a chorus of a hundred male voices supported by an orchestra of 25 pieces, the doors of the new Grand Central Palace were thrown open last night (Wednesday) and the National Association of Automobile Manufacturers' show thus was formally inaugurated. The singers and musicians were massed in the center of the main floor, and lifted their voices and blew their instruments when the signal was given by Manager S. A. Miles to indicate that the auspicious moment had arrived. Miles made his mark as the promoter and manager of the Chicago shows, and there for several years he mixed music, vocal and instrumental, with the motor cars and liked it so well that he tried it on New York last night.

This is the first automobile show to be held in the new Grand Central Palace, the building that will house New York's only big automobile show for at least five years to come, and as Madison Square Garden is sheltering its last motor car show the new Palace is containing its first one, and it holds both cars and trucks. It is the first free-for-all show held in New York since the declaration of peace between the warring factions born of the now dead Selden patent, and the genuine friendly feeling that at present exists indicates that the deciding voice of the law swept away all rancor and malice with the dust of the Selden patent.

The opening of the Palace show was marked by incidents that were interesting and some that were amusing. Every exhibitor at the Garden was invited to be a member of the party that, as N. A. A. M. guests, opened the Palace show, and those who accepted—and they were many—were conveyed to the Palace in automobiles furnished by the Palace exhibitors. The contingent was headed by Col. Charles Clifton, president of the Automobile Board of Trade, W. E. Metzger, president of the N. A. A. M., and other officers of the two organizations.

An amusing incident took place in front of Madison Square Garden during the evening. The crowds seeking entrance to the old building were tremendous, and the doors were blocked with would-be show-goers. While the jam was at its thickest some genius set up in an open window on the opposite side of Madison avenue a huge phonograph, with a cavernous amplifying horn. From the mechanical throat of the machine came, in stentorian tones, words of admonition to the struggling people to "Go to the Palace and see a real show," and other advice of a similar nature. And not a few, giving up the task

of getting into the Garden before freezing, followed the advice and took the trolley cars to the corner of Lexington avenue and Forty-sixth street, where the show holds forth.

It is a peculiarity of the shows held by the N. A. A. M. that they always have had a distinct Western flavor—a touch of breeziness and a dash of "hustle" that is imparted by the predominating number of Western manufacturers and their products. Another characteristic of this show is that it is primarily a show that is interesting to the man of moderate means, for while there are a few cars of the kind that are denied the average man because of their high prices, the vast majority of the machines are of the moderate or low priced varieties—the types that have been developed so rapidly during the last few years—the cars that truly are "within the reach of all."

There is no lack of exhibits at the Palace show, though the number is considerably less than at the Garden. Altogether there are 138 exhibitors, 38 showing gasoline pleasure cars, 34 commercial vehicles and seven electrics. Accessories are shown by only 59 concerns, nearly all of whom also have displays in the Garden.

The following are the vehicles that are on exhibition:

Electric Passenger Cars—Argo, Columbus, Hupp-Yeats, Standard, Toledo.

Gasoline Passenger Cars—Abbott-Detroit, Auburn, Bergdoll, Cole, Cutting, DeTamble, Fiat, Firestone-Columbus, Great Western, Havers, Herreshoff, Hupmobile, Imperial, King, Kline-Kar, Krit, Lion, Marion, McFarlan, Metz, Middleby, Otto, Paige-Detroit, Parry, Paterson, Penn, Rambler, R-C-H, Regal, Schacht, Stutz, Stuyvesant, Velie, Warren-Detroit, Westcott.

Electric Commercial Vehicles—Argo, Walker.

Gasoline Commercial Vehicles—Aries, Atlantic, Atterbury, Best, Brooks, Cass, Chase, Commer, Commerce, Dart, Dayton, Decatur, Detroit, Motor Wagon, Eclipse, Federal, Gramm, Kelly, Knickerbocker, Koehler, Lauth-Juergens, Lippard-Stewart, Maxim, Modern, Newark, Packers, Poss, Sanford, Schacht, A. O. Smith, Sullivan, Universal, Veerac, Velie, Walter.

To Extract Tires from a Burbank Cactus.

Luther Burbank, the plant wizard, who has done about everything except extract moonbeams from cucumbers, is credited with having produced a new species of spineless cactus which contains a caoutchouc-like substance which, according to enthusiastic reports from California, where Burbank performs his wonders, is expected to "become widely used as a substitute for rubber," in fact, the wild-eyed reports from the Pacific Coast would have it believed that the cactus will also provide a beautiful whitewash which will "whiten" tires, so to speak, in the making. How the "cactus juice" will compare with real caoutchouc is not explained.

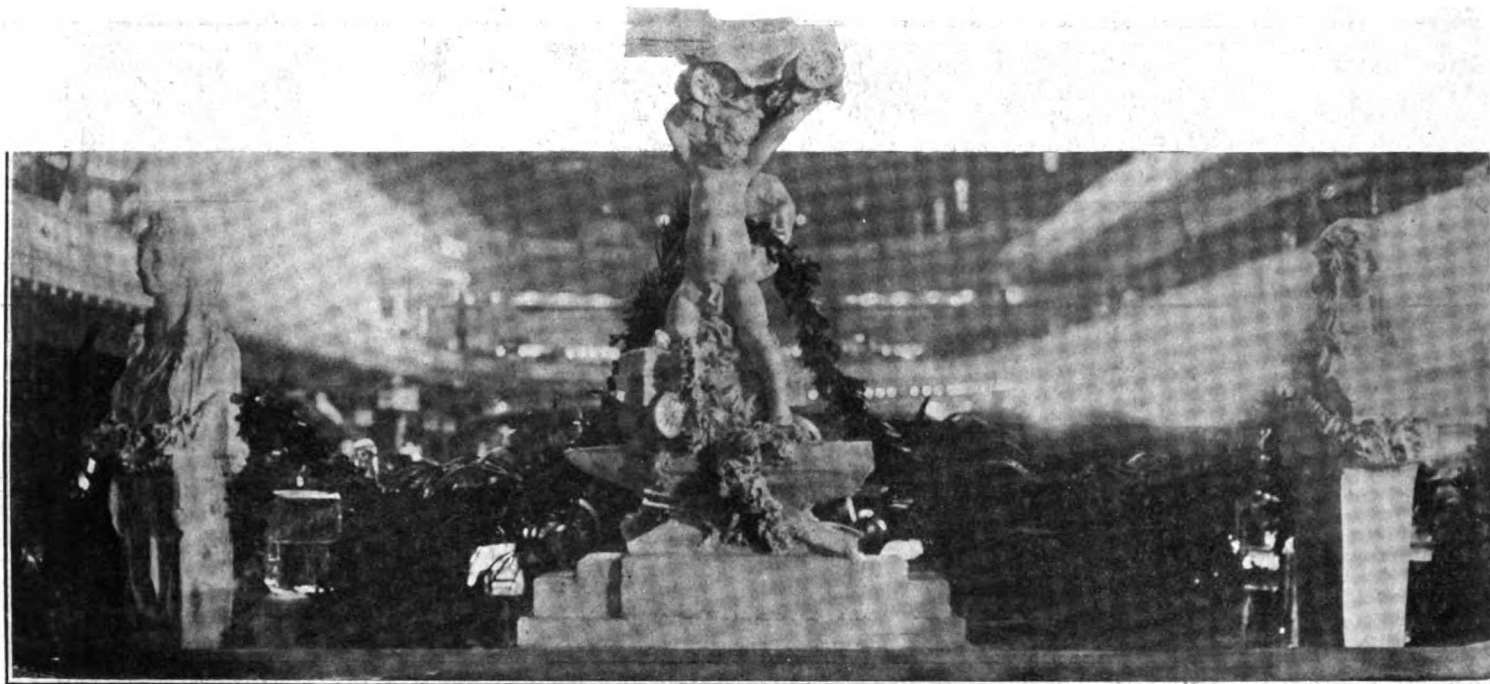
FOR TRUCKS' TURN IN THE GARDEN

They Will Move in On Monday—Notable Display of Notable Commercial Vehicles in Prospect.

When on Saturday night next, 13th inst., Madison Square Garden's massive doors are closed to the horde of the curious who, for a whole week, day and night, have thronged the big enclosure and gazed on the very latest that the automobile industry has to offer in the way of pleasure vehicles and the thousand and one littler things that are styled "accessories," it will indicate only a temporary suspension of activities for commercial cars have still to enjoy their inning. And according to the opinion of not a few it will be just as important and as crowd-drawing an inning as the passenger cars now are having. Obviously, this is as it should be for there must be few who have failed to grasp the increasing enormity of the commercial vehicle branch of the industry, and its close connection with every other industrial enterprise.

The second half of the show, for it really is one big show split up into two sections for the simple reason that there is not room enough in the Garden to house both passenger and commercial cars at once, will be thrown open to the public at 11 o'clock on Monday morning, 15th inst., and for the rest of the week the motoring public will be able to feast its eyes on old and well-tried features and new features, and its mind on facts pertaining to both gasoline and electric trucks. The doors will be closed finally on Saturday night, 20th inst.

From the point of the number of individual brands of trucks displayed, the show will not be quite as great as was last year's, though it almost goes without saying that it will make up in quality what it lacks in quantity. There will be 24 makes of gasoline trucks on view as against the 26 that last year were displayed; the number of exhibits of electric cars remains the same and is seven. Of the 24 makes of gasoline cars, however, five are new in the sense that they appear for the first time at a New York show. They are the Speedwell, Buick, Cartercar, General and Lozier. The others embrace such well-known products as the Alco, Autocar, Brush, Garford, Grabowsky, Knox, Locomobile, McIntyre, Mack, Hewitt, Morgan, Packard, Peerless, Pierce-Arrow, Pope, Reo, Sampson, Stearns and White. Similarly, three of the makes of electric trucks make their initial appearance at a New York show; they are the American, the Baker and the Bronx. The other four electrics are as follows: General, Studebaker, Waverley and Ward. Some score of accessories that were not shown the first week also will be on view.



None Better Than Garden's Good-Bye Show

Every other person will assert that it's not only the last one, but the best one; but it isn't. There have been others just as good. But there never was a better one.

All of which, of course, applies to the twelfth annual automobile show which opened in Madison Square Garden, New York, on Saturday evening last, 6th inst., and which will hold the boards until next Saturday night.

Of late years each succeeding show in the Garden has seemed the best one. Last year—the year of the “great white show,” it appeared that the limit had been reached, and there are those who still think so. The white decorations were cleanly, cheerful and wholesome, and broken by just enough color to relieve the monotony, it seemed as sunshine compared to—well, say, moonlight. It did not seem that a public exhibition of the sort, particularly a display of purely mechanical products, could be displayed to better advantage.

But as the Garden soon is to be demolished and possibly because of the undercurrent of regret coupled with the fact that “last and best” is rather euphonious and rolls easily off the tongue, it has been often repeated since Saturday evening last.

The setting for this year's show is styled “an Oriental garden,” a designation which in itself implies color, and lots of it, but for all of that it is just as well that it was explained in advance that the setting was oriental. The immense three-ton “property” canopy which hides the ceiling from view practically is the only oriental feature that is recognizable. It may be of Tur-

kish design, or Persian, but it is red and gold, and some other colors at any rate. The balconies themselves are hidden by a false work railing of brown red, in the panels of which the names of the respective exhibitors appear, and the names stand out as never before.

The general lay-out of the show is the same as characterized its immediate predecessors. The electric fountain is there at the entrance to the main hall and the plant life which adorns it looks familiar, but the statuary is different, and, truth to tell, the statute typifying “The Motor Era,” which constitutes the central figure, is an attractive bit of modeling, and one that is as apt as it is attractive; it improves on acquaintance. The figure is that of a lusty youngster standing astride a loaded motor truck and holding aloft a motor car, the truck and the boy himself being perched on an anvil.

The foyer of the Garden has been entirely transformed and is distinctly pleasing. Walls and ceiling are entirely hidden by greenery with here and there a white statue of an allegorical figure. It is after walking the length of the foyer and, incidentally, surrendering an admission ticket, that one enters the Oriental garden beyond. If so minded the show-goer may take one step to the right before entering the main hall and visit what is styled the exhibition hall, but which often has served as a restaurant; and it is there that he will find another pleasing decorative effect. The exhibition hall has been transferred into a Mexican patio and though the effect is hard

to grasp at first sight, the patio is well conceived, and well carried out, even to the red tiled eaves. A big pergola supported by Doric stucco columns extends about the room and through each archway is obtained a glimpse of Lower California scenery, the scenery being paintings typical of the country and in which the effect of distance is obtained. Another and small vine-twined pergola with cross beams occupies the center of the patio and it is beneath this pergola that the central exhibits in exhibition hall are displayed.

Few showgoers, however, first visit exhibition hall; the tide of travel always is toward the main hall—the arena in which there is size, height, “distance” and light—and the Oriental canopy. From the main hall it is possible to descend to “the regions below,” that is, to the basement which is given over to the display of “unattached” accessories, and which with its buzz and industry always is suggestive of Coney Island or a World's Fair midway. If the show-goer prefers to ascend, there are three galleries of which he can make the round or he may digress from the first one and enter the concert hall which, for the present occasion simulates a cherry garden. The men who found the cherry trees which are doing duty found good ones and found them in flower. They all are abloom and so heavily laden with pink blossoms that any old-fashioned cherry orchard well might turn green for envy.

While popularly the show is known as the Automobile Board of Trade show, and though to all practical intents and purposes



GENERAL VIEW OF THE TWELFTH ANNUAL SHOW IN MADISON SQUARE GARDEN, NEW YORK

the members of that organization are responsible for it, the name Board of Trade appears nowhere—not even in the official catalog which gives only the names of the old A. L. A. M. committee, which for so many years has promoted shows such as no industry ever had had known before, viz. Col. George Pope, chairman; M. L. Downes, secretary, and Alfred Reeves. The initials "A. L. A. M.," however, appear on at least two of the ornamental lamps in the main hall and suggest that though the Association of Licensed Automobile Manufacturers is passing in its checks, it has one remaining, and is at least nominally responsible for the present show.

The weather gods have not been kind to the show. Snow was falling when it opened Saturday night, and since then howling winds have been laden with bitterly cold breaths of the sort that induces men to hug closely their own firesides. But despite the fact neither men nor women have hugged the firesides closely enough to visibly affect the attendance. Each night and nearly every afternoon the crowds have flocked in their old numbers and have placed elbow room at a premium. There is no indication that the public is tired, or is tiring of automobiles, or automobile shows.

From the spectacular viewpoint there is much to be seen, and that is worth seeing, the body work and the body finishes furnishing most of the "color." And of colors there is infinite variety and combinations of varieties, some of which defy description. Most of the master painters have evolved colors or tints, for which they have found their own names. But it is noticeable that the fiery reds of other years have passed; they are now very few and far between. Quiet colors are the rule.

As black is too generally used to be considered distinctive, no car can be said to have a distinctive color. And strange to say, while once it was possible—and still is possible to a large extent—to distinguish cars by their radiators or other fronts, many of the signs of such distinguishment or distinctiveness now are discoverable from the rear and in so humble a thing as the isinglass windows in the rear flaps of the folding tops. Nearly every car maker has windows or peep holes of different design and the designs are so many and diverse as to be almost remarkable. On the subject of colors, the Locomobile company has brought to bear an effective idea for displaying the color combinations which it offers purchasers. Cast iron miniature models of its car are mounted in series in bas relief on boards, after the manner of yacht models, each miniature car being finished in a different color combination.

There are the usual number of highly polished chassis and cutaway engines, but never was there a more interesting or instructive or effective exhibit of the sort than the "sliced" chassis of the Flanders

car staged by the Studebaker Corporation. It is cut fairly in two from end to end, the interior of each and every part, from spark plug and radiator to differential; being clearly shown in relation to the other parts.

Such unpolished parts as the inside of the frame and the interior of the tube enclosing the driving shaft are painted red, and as the halving was performed in a fashion that suggests the splitting of a lobster, the effect of the burnished steel and the red



TYPIFYING "THE MOTOR ERA"

paint heightens the suggestion and led one bright mind quickly to dub the chassis a "boiled lobster," which does not imply disparagement. Instead it is a master stroke. How the "slicing" was done has aroused much speculation, and caused many wild guesses, the uninformed apparently fancying that the metal chassis was cut through at one operation, as with a buzz saw. As a matter of fact, each part was sliced separately and the whole then assembled in its present form.

Of public interest in the Knight engine there is no doubt. At the Stearns, Columbia and Stoddard-Dayton booths, where cut-away Knights are displayed the crowd always is thickest. And that the interest is real and not mere curiosity is made plain, both by remarks and questions that are asked. The extent of this interest is so great as to be a cause for genuine surprise. It is much greater than there was reason to believe existed.

On the other hand, the show is remarkable also for the complete disappearance of the steam car. Once dominating the show, it gradually shrank in number until last year but one—a White—was in evidence. This year even the Whites all are "gasoleners."

There are less cars staged this year than last year—there being 189 gasolene and 13 electric pleasure cars on view, as compared with 264 gasolene cars in last year's show, while the number of car exhibitors is 60 and 67, respectively.

As to what the show contains minutatim, so to speak, it would take a very large sized volume to delineate for though there are certain well-defined tendencies, there is a legion of so-called, and it might be added in parenthesis, properly-called, refinements, which, though of prime importance, easily may be overlooked by the layman if for no other reason than that manufacturers themselves have deemed them of insufficient interest to exploit them in print.

As a matter of fact, the show is largely of such minor features—exactly as was the case last year—for it is a matter of common knowledge that design and construction have become so nearly standardized that at present the products of the various manufacturers can be grouped and in their essential features described in practically the same language. The product of each manufacturer has its own distinctive points, it is true, and always will have them, for it is seldom that designers can agree on the merit of a single method of construction; there always will be those who not without reason believe that in a particular design they have achieved the acme of perfection.

Which, in brief, accounts for the vast amount of difference if it really requires accounting for, in products which fundamentally are the same. There really is very little at the show that is new in principle. With the exception of six brands of car, all the cars displayed employ poppet valve engines, and every poppet valve engine is alike in principle, no matter how much it may differ in minor respects; similarly the two-cycle principle is scarcely less well known than the four. The other exception, of course, is the Knight motor, though this interesting mechanism, even, is not new, strictly speaking. It was exhibited four years ago in Chicago and again last year at the Importers' "Salon" in New York City, and those who cared to pry into its internals might have done so if they liked, for the opportunity was theirs.

But it is to be feared that not many cared to do so, and the Knight motor therefore is heralded by the show-going public as something new, and the Stearns and Columbia, and Stoddard-Dayton exhibits are crowded day and night by the curious. Perhaps it is because these Knight engines are American products and the others were not, for Americans, of a certain class, be it added, are notoriously patriotic. Perhaps when they gather a sufficient number of

nimble dollars they go over across the pond and buy foreign products, and though they don't always get "stung," to use a slangy but expressive word, gradually the truth that American products are every bit as good as foreign products—and a great deal better for use in America—is being forced on them.

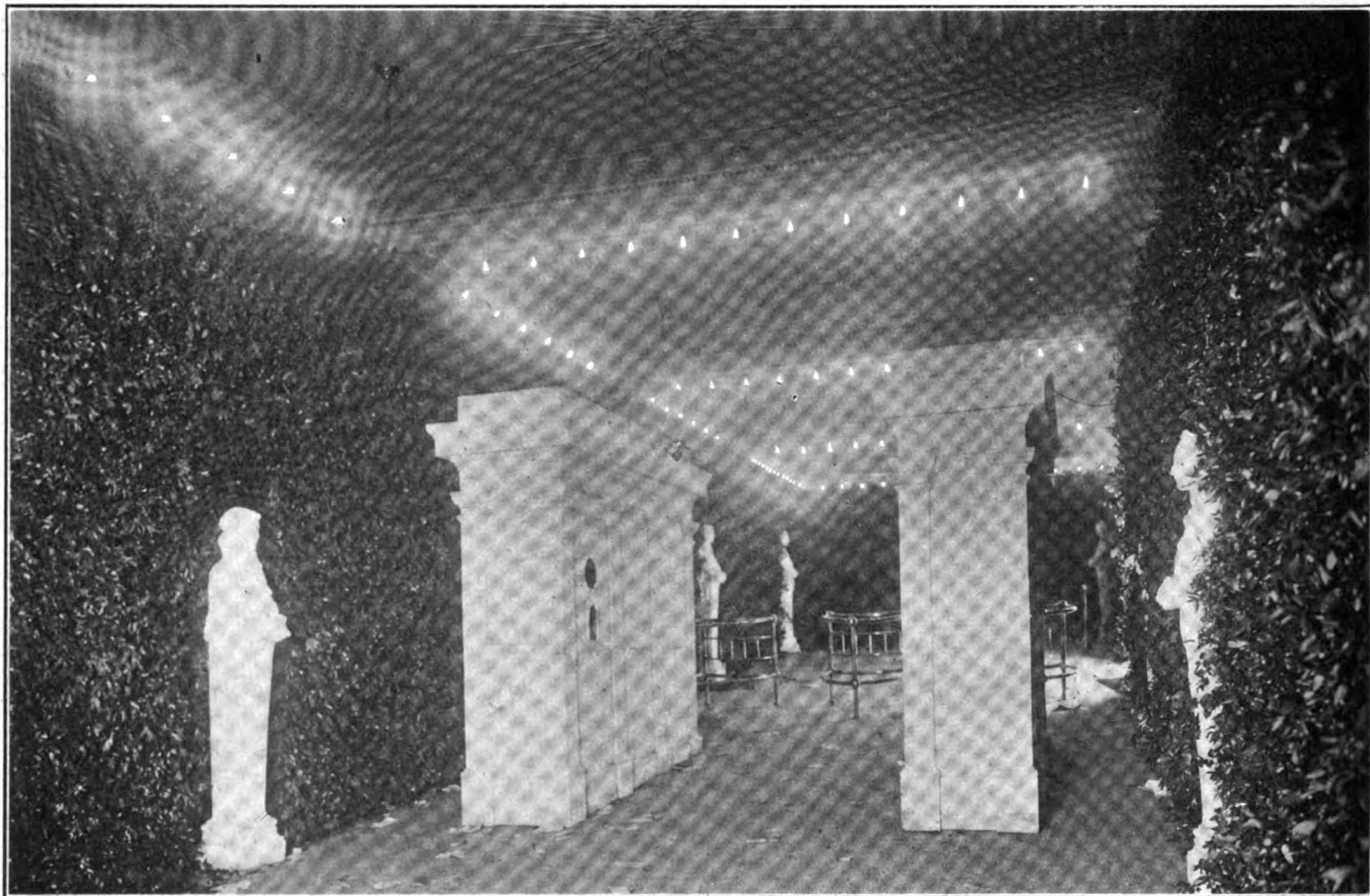
The statement made last year that the closed-front car would be the car of the future is well borne out by the show. With but a single exception every car exhibited is of the closed-front type. The excep-

ensemble scarcely was improved. There were ugly corners and angles, and things did not seem to fit together as they should. But this year all that is changed. Doors and bodies are designed together to form a harmonious whole, and they look the part; dashes have been reduced in size to meet the incurving bodies, and in the majority of cases the improvement is most marked.

The shadow which is cast by the tendency toward closed-front bodies is just one of those which hide a small but immensely

car, their combination with the lights being the most generally employed method of utilizing them to this end.

Another of the smaller features which has become pronounced is embraced in the shifting of the control levers to the center of the footboard. But a few manufacturers exploited this construction last year. Undoubtedly there exists much prejudice against it, though there seems only one logical reason why this should be so. It is that the construction is comparatively new and the human race is notoriously chary of



THE FOYER OF MADISON SQUARE GARDEN SHOWING "BOX OFFICES" AND THE PLEASING DECORATIVE SCHEME

tion is the Brush, which as every one knows is a single-cylinder light runabout of indisputable handiness. It scarcely could be improved by the addition of a closed-type of body and the manufacturers therefore cling to the open style. In connection with this unparalleled exhibit of closed-front, or front door cars, it is comforting to reflect that no little improvement in the method of constructing the doors and in the method of attaching them and of shaping the body to fit them, so to speak, has been made in the past year. To those who have good memories for such things it will not be difficult to recall the botched jobs that at the last show were exhibited as finished products. In some cases doors looked as if they had been added purely as an afterthought and the appearance of the tout

important detail, and this detail is embraced in the one word "ventilators." That it has come to be recognized that ventilators are a necessity, and not as first suggested, a luxury, is evidenced alone by the fact that there are very few manufacturers whose products lack them. As is the case with everything else, there is almost an infinite number of varieties in use; there are round ones and square ones and oblong ones, and they are placed in an equal variety of positions. In the dash, of course, suggests itself as the most likely position and this is where most of them are located. Ventilators suggest other possibilities, however, and they have not been overlooked. Perhaps the greatest of these is the possibility of so constructing them that they contribute materially to the beauty of the

new things, at least until their worth has been proven. The adoption of centrally located control levers by such well-known and conservative manufacturers as produce the Knox, Locomobile, Lozier, Mitchell, Haynes and Matheson cars, however, not to mention a number of others equally as prominent, should go far toward reducing the prejudice against the practice, and to instil a knowledge of its true worth.

Those who have adopted the feature of centrally located control levers naturally have dropped out of the debate over the question as to whether they should be placed inside or outside the body, though the debate still continues with almost an equal number on each side. Gradually the balance is swinging in favor of placing them inside, and in many cases the prelim-

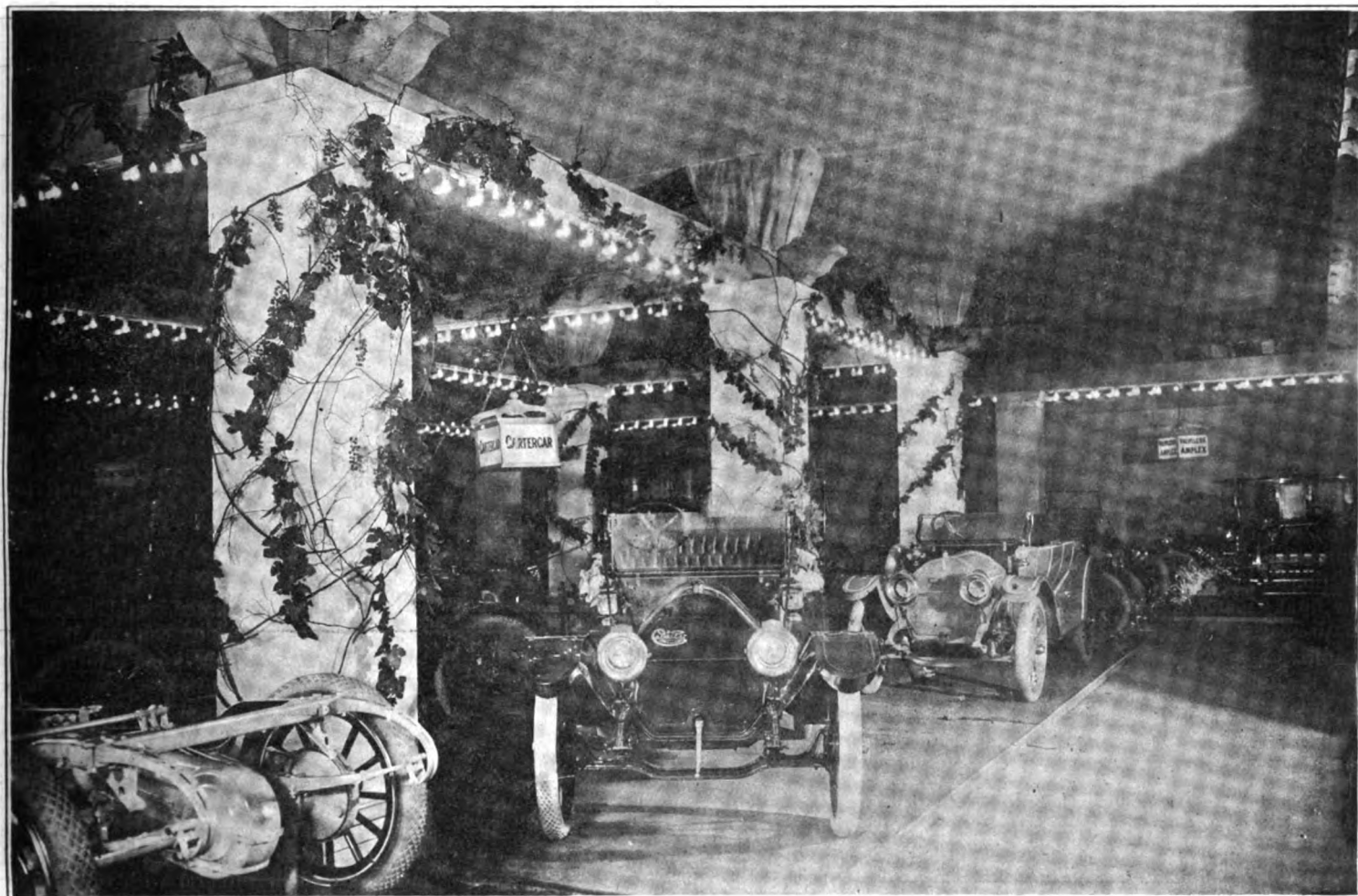
inary step has been taken by placing the gear shift lever inside and the emergency brake lever outside. But this practice too is open to question on the ground that as the emergency brake lever is the most important part of the car—in an emergency, as has more than once been pointed out—it might perhaps be better to place it, instead of the gear shift lever, in the more accessible place inside the body.

Engine-starting devices, of course, are a real feature of the show, though they scarcely can be classed as one of the

which approached the square, all of them recently have acquired long-stroke engines, which in itself is significant of the increasing popularity of the construction.

Comparing the present show with those of the past it is interesting to note that but one new make of car is exhibited. This is the Marquette which is a blend of the old familiar Welch-Detroit and Rainier cars. S. G. V. cars also are new in the sense that they make their first public appearance at a show, though they have been on the market for some time. The others are all the

exude and this year's crop of cars is no exception to the rule. The limousines, of course, are the most impressive and in the adoption of an arched roof over the doors, to provide easier entry and exit and also to relieve the monotony of straight-line effects somewhat, the manufacturers have at once hit upon a design that upholds their reputation for exclusiveness, and at the same time serves a useful purpose. There are two cars of this type shown, and without danger of straining, even a little bit, the exact meaning of the English language,



GENERAL VIEW OF THE "PATIO" SHOWING ITS GRAPEVINE EMBELLISHMENT

smaller ones. Without going deeply into the matter of statistics, it might be said without fear of contradiction, that very nearly half the cars in the Garden are equipped with some form of engine-starting device. There is a strong sentiment in favor of the acetylene type, which is most used, probably because it is efficient and easily attached and requires but small rearrangement of engine details.

As regards engine construction, the tendency toward an ever increasing stroke-bore ratio has on more than one occasion been remarked, and is amply borne out by the dimensions of the motors of the current crop of cars. Though cars bearing the brands of Knox, Pierce-Arrow, Maxwell, National, Mitchell and Oldsmobile heretofore have been distinguished by motors

products of well-known manufacturers, and though each has been changed slightly, and each contains distinctive features, all its own, it is necessary to take up each brand separately and examine it carefully, the better to appreciate the fine points which are retained and those that have been added.

**Pierce-Arrow Cars—Power Range, 36—66;
Price Range, \$4,000—\$7,100.**

When last year the Pierce-Arrow Motor Car Co., evolved its striking and picturesque George Washington coach, it was, strictly speaking, in line with the policy of the company to produce exclusive and distinctive designs. As a matter of fact Pierce-Arrow cars always have been marked for the air of exclusiveness which they fairly

they are works of art. Both are mounted on the "66" chassis; one is done in a pleasing shade of maroon, and the other is a more sober and sedate black. There also is a five-passenger closed-front touring car which is a symphony in light green, upholstered in natural color pigskin, and it is flanked by a big, roomy seven-passenger touring car finished in black.

With but a single exception, which is in the cylinder dimensions of the "66" motor, mechanical changes in any of the three chassis are few and far between. Reflecting the modern tendency toward long stroke motors, the stroke of the "66" has been increased to seven inches and the bore has been reduced from 5¼ inches to five inches; that the motor really belongs in the long-stroke class therefore is beyond cavil; the

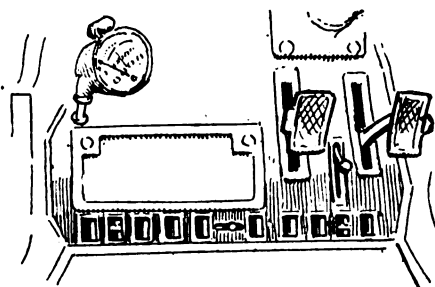
stroke last year was $5\frac{1}{2}$ inches. The dimensions of the two smaller motors, however, remain the same and are $4 \times 5\frac{1}{8}$ for the 36-horsepower model, and $4\frac{1}{2} \times 5\frac{1}{2}$ for the 48-horsepower model. In all the motors, the pump has been moved forward a little and the pump-shaft lengthened to facilitate the coupling of a lighting generator. Provision for mounting the generator is made in the placing of four bolts in the crankcase to support a bracket. The distinctive Pierce-Arrow gravity oiling system in which a constant flow of oil to all the bearings is maintained, the oil being carried in a reservoir attached near the top of the cylinders and to one side, is retained without change. The method of attaching the rear springs to the chassis frame has come in for slight revision, the springs now being attached to the under side of the rear extended frame gussets instead of over them. This permits slightly flatter springs, with decreased body movement and tends to increase the harmonious exterior of the cars by eliminating more or less abrupt curves. The remainder of the transmission elements are unchanged with the exception of the clutch which has been fitted with a brake to insure quiet and easy gear shifting, and a leather face, though this latter feature is optional.

Other minor changes which have been made and which come under the general head of refinement of detail embrace the adoption of a priming device, operated from the driver's seat, a small lever and suitable piping serving to cause the introduction of a spray of gasoline directly into the intake manifold, and a general increase in tire sizes. Electric lights have been a feature of the line for several years, and add the final touch to complete the really luxurious car.

Oldsmobile Cars—Power Range, 35—60; Price Range, \$3,000—\$5,000.

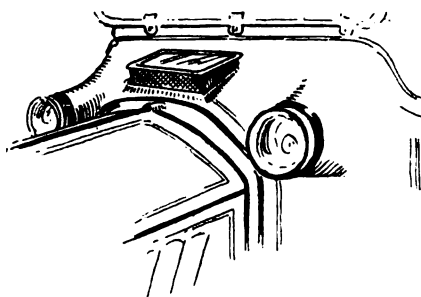
Oldsmobile cars properly belong in the class of impressively constructed vehicles in which the character of the manufacturer stands out in bold lines. The big Oldsmobile "Limited" with its six-cylinder 60-horsepower motor and four-cylinder "Autocrat" are supplemented by a new model which is styled the "Defender" and which is in reality very little smaller than the "Autocrat," of which it is a smaller edition despite the fact that it is virtually the "baby" of the line. Like its predecessors, it incorporates a T-head motor, and by reason of the reputation for excellence which the Oldsmobile line has attained, well may be proud to display many of the cardinal features which serve to distinguish these cars from others. Two body styles are shown on the Defender chassis, one of them an inside driven coupe of the type which lately has sprung into prominence, and the other an orthodox five-passenger touring body of the closed front variety. The coupe is distinguished by the absence of the usual gasoline tank at the rear, this

necessary adjunct being carried in a roomy compartment behind the body which also serves as a receptacle for tools and spare parts. The car is controlled from the left side and the gear shifting and emergency brake levers are placed in the center of the footboard. The touring body is of the right-hand steer variety, and a neat little wrinkle which also is a feature of the other cars in the line is the incorporation of a shutter ventilator in the footboard by means of which warm air from the engine may be admitted to the front compartment to help keep the driver's feet at somewhere near normal temperature during frigid



FOOT WARMER ON OLDSMOBILES

weather. A somewhat unusual torpedo body, finished in bright yellow, striped with black, is mounted on an Autocrat chassis and always serves to attract attention. The front of the body, where it meets the dash, is formed to receive the side lights which are let in; they are electrically operated and viewed from the front present an odd appearance. This body also is fitted with a novel "skylight" in the skuttle. It is designed to admit light enough to make plain



OLDSMOBILE SKUTTLE VENTILATOR

an otherwise dark dash, and also is arranged so that it may be raised when it forms a wind scoop and serves to ventilate the front compartment.

The older models have been changed but slightly, the visible changes embracing the adoption of a new form of rounded hub cap and the location of a manually controlled auxiliary air intake to the carburetter on the steering post. The control takes the form of a sliding sleeve which fits over the tube which encloses the throttle and spark advance levers. Delving still deeper reveals the adoption of a new form of springs in which auxiliary leaves come into play when unusually bad roads are encountered or when the car is overloaded.

Other detail refinements include the addition of a compression release, the adoption of a new form of universal joint between the clutch and the change gear mechanism, and the re-location of the oil reservoir filler so that it is more accessible.

Winton Cars—All Models of 48-horsepower; Price Range, \$3,000—\$4,750.

At this time when six-cylinder cars and self-starters have attained prominence in the public eye, it is pertinent and fair to remark that the Winton led the way in respect to the adoption of both, the "six" and the self-starter having been Winton features for several years. As might be expected of a concern that laid an excellent foundation years ago, the product has become standardized, and the changes made from year to year are slight indeed. For 1912 there is but one refinement that ranks as notable—a new universal joint with very liberal bearing surfaces and simple and effective means for their lubrication. The joint has as a basis a hollow rectangular central body with four arms or trunnions projecting from four faces, the whole forming the "cross" of the universal joint. The body and hollow trunnions are packed with grease. Bronze thimbles slip over the open ends of the trunnions and come up close to the square body, leaving just space enough for a felt washer or ring. The thimbles form bearings for the shaft forks and at the same time tightly close up the grease-filled center. A small hole drilled in the end of each thimble allows grease, thrown outward by centrifugal force, to pass to the bearings along grooves cut for the purpose, there being caps on the forks to cover the thimble ends and prevent grease from going anywhere except direct to the bearings, where it is retained by the felt washers. Owing to the large area of the bearing surfaces and the ample supply of grease packed in the hollow joint, it is expected that one filling will last for a year's ordinary running. In the engine, the only change is that the cams in the 1912 model are made integral with their shafts, instead of being separate as in the past. A little easier riding is secured by stretching out the wheelbase from 124 inches to 130 inches, and increasing the diameter of the wheels from 34 to 36 inches, and a body refinement consists in sinking the side lights into the dash, the lamp fittings being made to serve as ventilators as well. No new models have been added.

Alco Cars—Power Range, 42—54; Price Range, \$4,500—\$7,250.

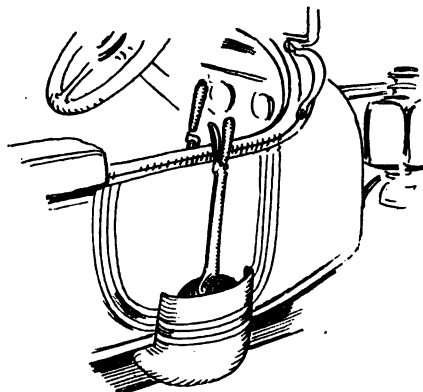
While it may or may not be the effect of association, the very name "Alco" seems to suggest solidity and comfort in motor cars—an impression that is by no means dispelled by an inspection of the cars themselves. The Alco people seem to have met their mechanical troubles and to have overcome them years ago, so that the cars they build are standardized, and frequent

or marked changes are not necessary. At any rate, the cars they will carry through the year 1912 will be so like those of the preceding year that the difference will be imperceptible except to an expert, so far as the mechanical features are concerned; and though there are a few new things in body construction, they too are inconspicuous, though of a character to make themselves felt—the little things that go so far toward making or marring the pleasure of motoring.

The new Alco Berline—big, roomy and as nearly palatial as a motor car can be—embodies about all the changes that appear in the 1912 cars, both in mechanism and in body work. This car is fitted with a roof of the so-called "Pullman" construction, with narrow ventilating windows running lengthwise—a method of ventilation that long has been recognized as efficient for railroad cars, but has rarely been applied to automobiles. In addition to the usual window in the back of the body at the center, there are two "marine windows" of

illuminate the step when the rear door is opened, automatically switching off when the door is closed.

In the department presided over by the



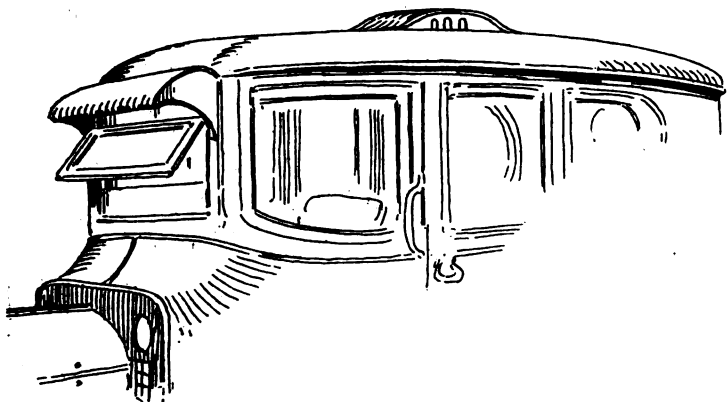
ALCO LEVER HOUSING

chauffeur there are some things that are of interest. For instance, the tool box on the running-board, of steel and weatherproof, houses the acetylene gas tank, only the

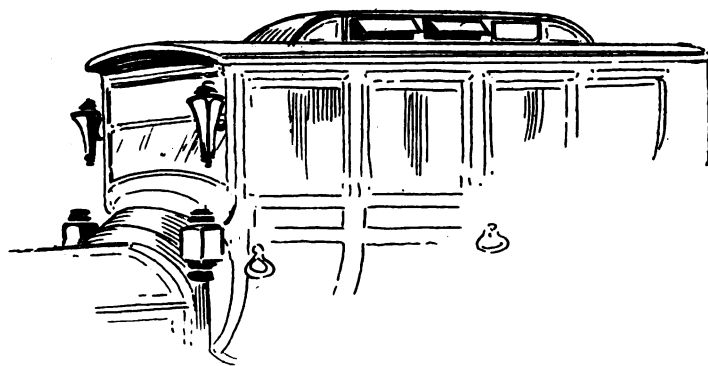
dow line of closed bodies. This "Alco band" will be white, as a standard color, but will be made of any desired color on order.

Marmon Cars—All 32-Horsepower; Price Range, \$2,750—\$4,500.

Characteristic of Marmon practice, the single chassis which is listed has undergone but slight revision but of the sort calculated to render its action sweeter and more uniform. Though the distinctive Marmon rear axle is retained, the differential mechanism has been redesigned with a view to increasing its efficiency and to render it more noiseless than ever. The drive pinion instead of being integral is separate and is merely a ring of teeth which is fastened to the differential casting by means of a number of bolts. This construction, it is explained, permits the use of less metal in the mechanism and consequently reduces its weight and the tendency to vibrate at extreme speeds. The motor is substantially the same as heretofore, except that its power range has been



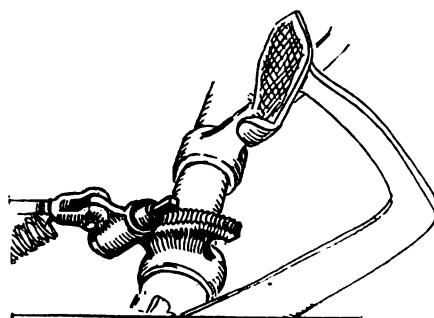
MARMON LIMOUSINE ROOF SHOWING VENTILATOR



"PULLMAN" ROOF ON ALCO "BERLINE" LIMOUSINE

oval shape, one on either side of the central window, making it possible for the driver of the car to see what is behind the car much more readily than when there is but one window. The windows in the doors are equipped with "regulators" so that the mere turning of a T-handle raises or lowers the window, which remains fixed wherever it is left. As a matter of course, the car is fitted with a very complete electric lighting system; in addition to the usual side and tail lamps and dome lights, there are two reading lights in the rear compartment of the body, placed in the corners. These are carried in ingeniously contrived holders mounted on pivots. The lamp and its holder are held stationary, but a slight pressure of the hand causes it to turn on its pivots and snap into a reversed position, with the lamp facing inward and a rounded surface outside; at the same time the lamp is automatically extinguished. This not only extinguishes the lamp and conceals it when not in use, but protects it from accidental damage. The dome lights are rather noticeable, each having three lamps. Perhaps the most unusual bit of illuminating on the car is the step light, a little lamp, hidden, but so placed as to il-

head of which can be seen. This economizes space and at the same time adds to the appearance of the car as a whole. The shutting off of the gasoline from the carburettor is made easy by placing the handle of the valve just outside the frame



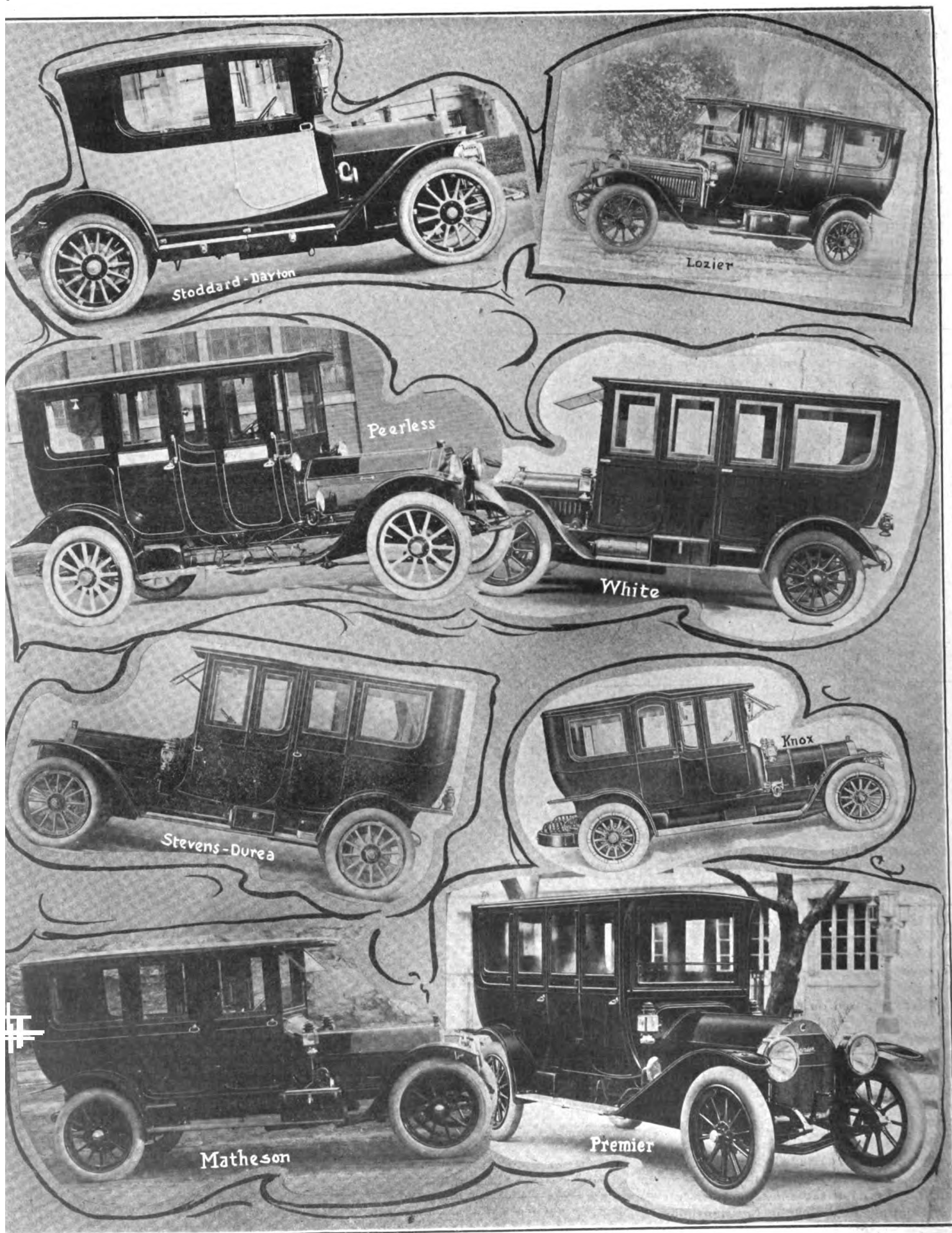
MARMON BRAKE ADJUSTMENT

near the driver's seat, the handle extending through the frame to the cock inside, the arrangement being of the kind that appeals to the comfort-loving proclivities of both owner-driver and chauffeur.

All Alco cars for 1912 will be distinguished by a band running along the tops of the open bodies, and just under the win-

increased by enlarging the carburettor and the manifolds. The tire sizes also have been increased as have the brake drums; the feature of twin internal expanding brakes is retained, however. Conforming to the general tendency, a self-starting device of the acetylene type has been added and hereafter will be standard equipment. There is one type of body exhibited which should delight the eye of the feminine, and the masculine, too. It is a four-passenger enclosed limousine which partakes of the features of the inside driven coupe in that it has but two doors. Outside it is tastefully finished in two shades of brown and the running gear is bright red. Inside, the finish is in fawn colored broadcloth, the woodwork, such as the window sashes and the roof, being in bird's-eye maple. To revert to distinctly British phraseology, it is altogether a very fetching piece of work. One of its clever features is the method of ventilation which is employed. It embraces a raised portion in the center of the roof, in the sides of which small shutter ventilators are fitted. Another of its peculiarly distinctive features lies in the use of electric side lights which are arranged flush in the dash so that on occasion the reflec-

THE MOTOR WORLD



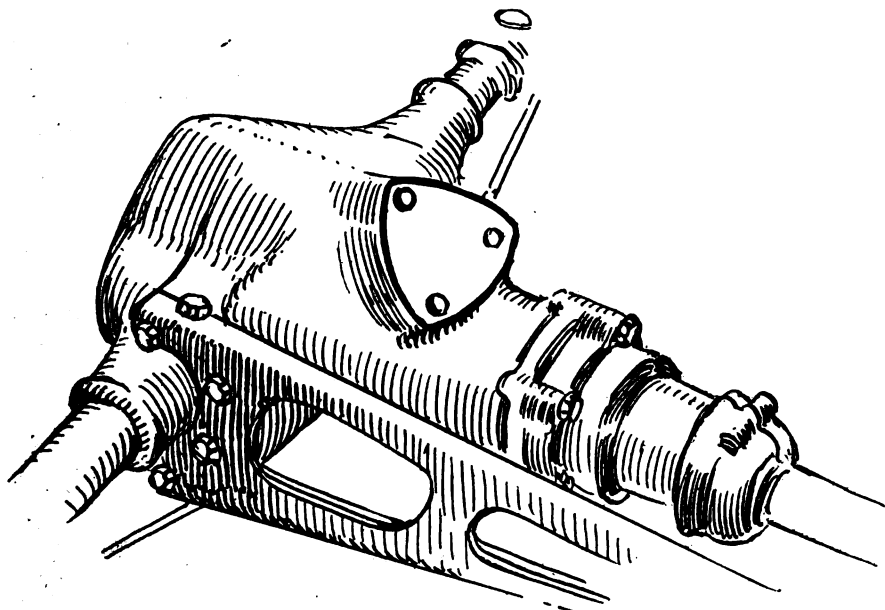
LUXURIOUSNESS AT THE SHOW—SOME OF THE PALATIAL BERLINES IN EVIDENCE

tors may be simply hinged back to light the interior of the body.

**Locomobile Cars—Power Range, 38—48;
Price Range \$3,500—\$6,250.**

The Locomobile line which last year was

is that in the "little six" motor the fan is driven from the crankshaft instead of from the timing gear train. This permits the location of the pump further forward to make provision for a bracket on which a lighting generator may be mounted.



LOCOMOBILE ONE-PIECE AXLE HOUSING

increased by the addition of a six-cylinder car—the first to come from the factories of its well-known producers—has been still further increased by the addition of another "six" which is virtually a smaller brother to the 48-horsepower model. It is styled the "little six," by way of distinguishing it from its prototype, and needless to add, reflects the usual Locomobile thoroughness. In it are incorporated all of the distinctive features which in the past have contributed materially to the smooth action and reliability of the cars that bear this brand. Like the larger "six," the new model has its cylinders cast in pairs and mounted on the characteristic bronze crankcase. Cylinder dimensions are $4\frac{1}{4} \times 5$ inches, bore and stroke, respectively, and the valves are exceptionally large, conducive to power and flexibility. As a matter of fact though the motor is rated at but 38-horsepower, it is guaranteed to develop no less than 60 on the brake which coincides with the usual Locomobile conservatism of rating. In retaining the unique lubrication system, one noteworthy change has been made. To permit of the option of either left or right hand drive, left hand drive necessitating that the cylinders be reversed to bring the exhaust pipes on the opposite side in order to leave room for the steering column, the oil pipes which are outside the crankcase in the larger motor are completely enclosed in the "little six." This is to leave room for the steering column and to facilitate reversing the cylinders. The oiling system itself is quite simple and embraces a gear pump which forces the oil in a constant stream to all the bearings. There is one other small difference in the two "sixes" and that

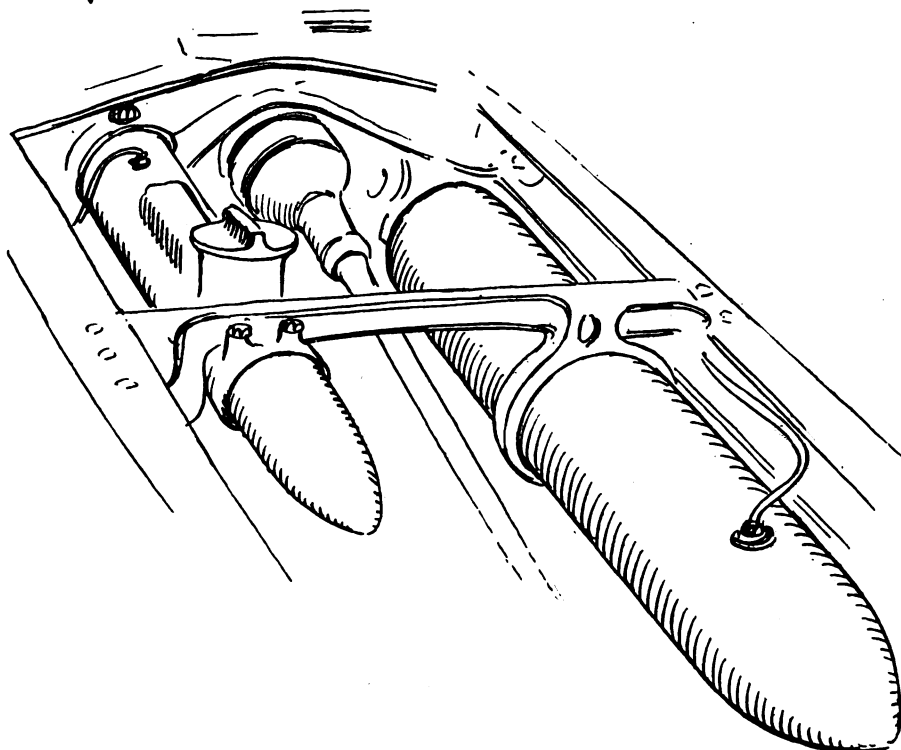
Except for a slight difference in size, the transmission elements in both cars are the same, the distinctive four-speed

pieces bolted together as heretofore. The shape and location of the torque rod also has been changed to insure smoother action; the tubular member has been replaced by one of pressed steel, and it has been shifted to the opposite side of the chassis, where it is in a better position to absorb the torque reaction. The adoption of a large ball-bearing universal joint, in which the balls are two inches in diameter, instead of a block joint at the front of the propeller shaft is another little point which scarcely is noticeable, but which nevertheless adds to the smoothness of action of the whole. The four-cylinder 30-horsepower car, which has made a name for itself for consistency and reliability, is continued unaltered.

Thomas Cars—Power Range, 40—70; Price Range, \$4,000—\$6,000.

Of the manufacturers of six-cylinder cars the E. R. Thomas Motor Co. stands high, both in the mechanical excellence of its chassis and the beauty and luxury of its body-work. And not only are the Thomas "sixes"—the company produces no fours—built on sound engineering lines, but they embody a number of original features that compel attention. In the cars exhibited there are several new things, none affecting the general design of the car, but some of them having a real and beneficial effect on its operation.

Perhaps the most important, and cer-



LOCATION OF THOMAS TUBULAR TANKS

selectively operated change gear mechanism in its bronze case being a feature of both. The rear axle housing of the 48-horsepower model has been altered so that the differential mechanism may be lifted out intact by the removal of two bearing caps and is in one piece instead of being in two

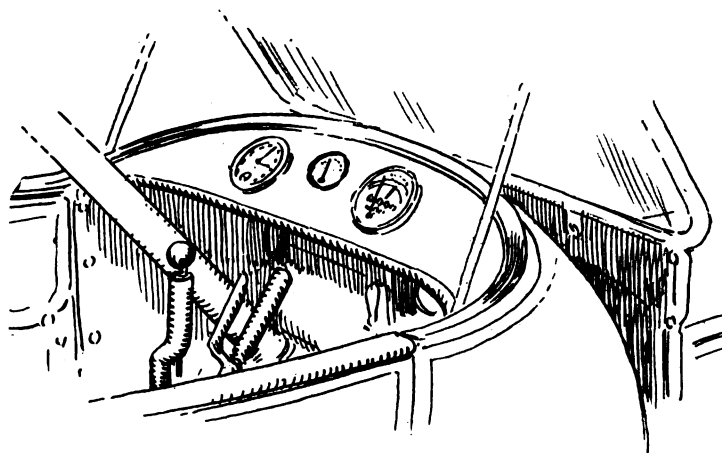
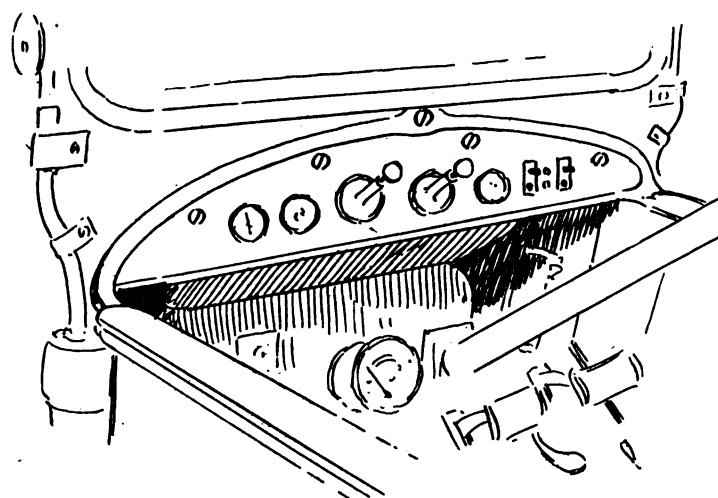
tainly the most conspicuous, improvement made is the disposition of the gasoline and lubricating oil tanks. As a glance at the chassis of any shaft driven car will show, there is a long empty space on each side of the propeller shaft that is seldom of any use because of its unfavorable location.

On the other hand, there is always a great dearth of room for storage in car bodies. These two facts, rubbed together by the Thomas designer, produced a spark—an idea—and the result was the placing of the two tanks in the spaces referred to, leaving the compartments under the seats, commonly used for tanks, available for other purposes. Air pressure is relied upon to force the gasoline to an auxiliary tank, from which it is fed to the carburetter by gravity; air pressure is automatically maintained by a pump operated by a cam on the exhaust camshaft; each tank has a raised space on top into which the liquid cannot go, to provide space for air when the tanks are filled. The oil tank is designed as a reservoir for spare oil, and it eliminates the necessity for frequent stops for oil

the result being that the compression has been very considerably reduced. The performance of the engine has been improved in this way and the fuel consumption decreased.

There are numerous details in the new Thomas cars that indicate the touch of an experienced hand. There is a long, narrow horizontal closet in the bottom of the space under the driver's seat with a door opening into the tonneau; this is for the stowage of the side curtains, the celluloid windows of which are so often cracked—from being folded and stowed in places where there is no room for their proper disposal. Another "trifle" is the cutting of a groove in the thread of the cap in the oil tank, so that if the cap is unscrewed while there is air under pressure in the reser-

maintain the drive wheels in more constant contact with the road surface. Door hinges now are completely concealed and by an ingenious arrangement of the speedometer and clock in the deep skuttle dash these instruments are rendered as easily visible to occupants of the tonneau seats as they are to those who ride "up front." Two new chassis that follow closely the general line of previous Knox practice have been added and include a "four" and a "six," both of which are equipped with motors which measure 5 inches bore and $5\frac{1}{2}$ inches stroke. Except for the addition of a two-bladed fan in place of the six-bladed one that has been used in the past, the mechanical details of the line have suffered little or no alteration. The distinctive Knox unit power plant, supported at three



TWO TYPES OF DASH ARRANGEMENT—THE THOMAS AND THE KNOX

when touring, and does away with the disagreeable practice of carrying cans of oil strapped to the dashboard. Still another advantage has resulted from the new position of the tanks. The very considerable weight of the reservoirs and their contents is much lower than in the ordinary construction, and the center of gravity of the whole car is thus brought much appreciably nearer the ground, adding in no small degree to the stability of the machine.

The Thomas cars are built with dashes of the modern skuttle type, but the practice of carrying the switch, gauges and the like in the depths of the cowl has been abandoned. Instead, they are mounted on a little "auxiliary dash" at the extreme rear end of the cowl, and not only is the switch brought much nearer to the driver's hand, but the various instruments are in plain sight, out of the shadow of the skuttle. The skuttle idea is carried a step further in the Thomas than in other cars, for a cowl, is built on the back of the front seat in the touring cars, producing an effect that is at once unique and pleasing to the eye.

A change has been made in the engine that has had a decidedly beneficial effect. The cylinders have been raised while the connecting rods have not been lengthened,

the unwary one will not be sprayed with oil, the air escaping through the groove while the cap is coming off. Several full threads are left to make a tight joint. The same arrangement is found in the cap of the gasoline tank.

While the "six forty" is the standard chassis, the Thomas company builds, on special order only, a "six seventy" which can be had with any of the standard body types.

Knox Cars—Power Range, 40—70 Horsepower; Price Range, \$3,250—\$6,500.

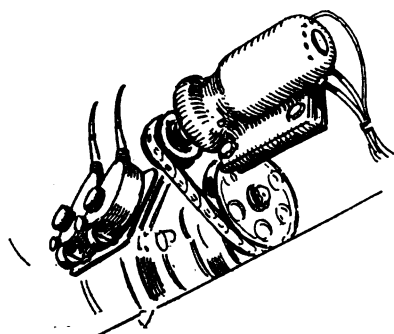
Knox control levers hereafter will be located in the center of the footboard instead of at the right side as heretofore, the change permitting either left or right hand position of the steering column at the option of the purchaser. That body styles have been improved throughout it is perhaps needless to add, and in the general revision, several unusual features are revealed. In the first place, a commodious tire carrier has been added and is located, not on the running board, but at the rear, hung horizontally below the luggage rack, which position assists materially in lowering the center of gravity of the car, while at the same time the added weight over the rear axle tends to reduce skidding and to

points, and embracing a valve-in-the-head motor with removable cylinder heads, remains one of the characteristic features of the line. Others which remain unchanged include the use of a three-plate clutch, full-floating rear axles and three-quarter elliptic rear springs.

Peerless Cars—Power Range, 24—60; Price Range, \$4,200—\$7,200.

By the addition of two new models, one having four cylinders rated at 40-horsepower and the other with a 38-horsepower motor of the six-cylinder variety, the Peerless line has been increased in size and includes five chassis sizes instead of only three as heretofore. The motors in the three older chassis, the four-cylinder 24-horsepower model, and the 48- and 60-horsepower "sixes," have been altered considerably, in keeping with the general Peerless policy which necessitates such alterations as shall make for the greatest efficiency, though in the matter of bore and stroke they remain the same. Thus, for instance, the old familiar barrel crankcase has been dropped and instead a horizontally split case bolted together is used in all the six-cylinder motors. The lower half serves merely as an oil reservoir, the new design permitting the use of seven bearing crank-

shafts instead of the four bearing members that have been used in the past. Though the change gear mechanism still is mounted on a sub-frame, the motors now are mounted directly on the chassis frame. To permit of the option of either left or right hand position of the steering wheel, the oiler no longer is cast integral with the crankcase, but instead is separately cast and is arranged to be attached to either side. Two independent Bosch ignition systems are used and one of the features of which the manufacturers are particularly proud is the hard rubber "wire-bar," so styled, through which the ignition wires are led. All the wires are led through it and emerge in close proximity to the spark plugs to which they normally are attached, the system eliminating much of the confusion which might result due to the number of wires necessary. The few other changes which have been made include the adoption of cork inserts in the clutches,



PEERLESS DYNAMO DRIVE

and a slight alteration in the springs which embraces the use of a greater number of leaves, which have been made thinner to ensure easier action. Two new items of equipment have been added and include a complete Gray & Davis car lighting system with electric lights throughout and a four-cylinder tire inflating pump which is operated by means of the change gear mechanism.

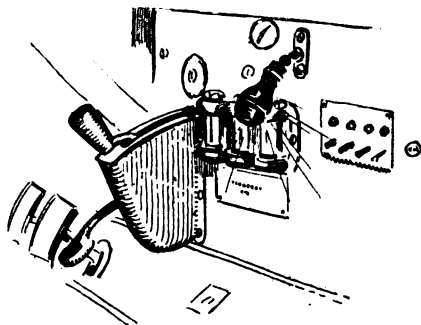
White Cars—Power Range, 30—60; Price Range \$2,250—\$6,700.

That the practice of casting all the cylinders of a motor in a single block is increasing in popularity is plain to all who care to see. Also that the manufacturers of White cars are firm believers in the excellence of the practice is evidenced in the latest White production which is a six-cylinder model which exemplifies this practice—the same that always has marked the four cylinder White gasoline motors since they were introduced several years ago. The 30 and 40-horsepower models are practically the same as they have been heretofore, intake, exhaust and water passages in both motors being cast integral with the cylinders, and the transmission elements being retained in substantially their original forms.

The principal features of both of these models include four-speed gear mechanism,

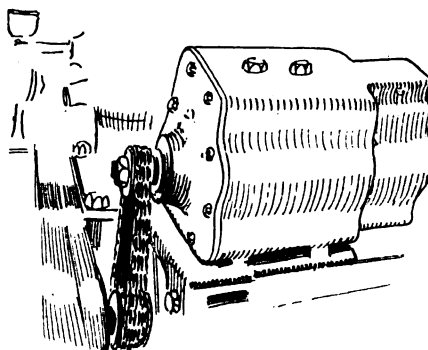
large leather-faced cone clutch, and semi-floating rear axles. The six-cylinder car is a new model throughout, of course, though it incorporates the same general features as to two smaller models. Like the 40-horsepower motor, the cylinders of the "six" measure $4\frac{1}{4}$ inches bore and $5\frac{1}{4}$ inches stroke, the methods of lubrication, ignition and cooling being common to all three motors.

The new "six" embraces one particular feature that is not found on the other two models, however, namely, an electric engine starting and lighting system. The



WHITE STARTING CONTROLLER

whole system throughout is of White design and is of unusual simplicity. The dynamo, which also serves on occasion as the motor starting agent is mounted on the left side of the engine on a suitably placed bracket. When running as either a motor or a dynamo it is connected to the engine through the intermediary of a "silent" chain which runs over a chain wheel on a shaft from the timing gear train. The remainder of the system includes an 18-volt storage battery which is carried in a tray below



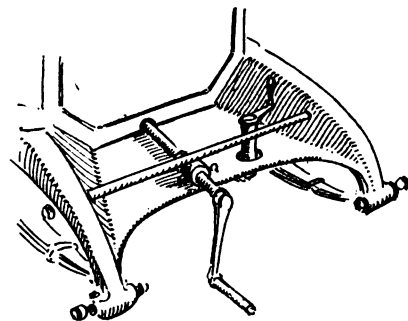
WHITE ENGINE STARTER

the tonneau floor, an automatic cut-out and controller lever located on the dash. The peculiar feature of the whole arrangement is that the relation of the dynamo, or the motor as the case may be, never is altered mechanically with regard to the engine, regardless of whether it is operating to charge the battery when the engine is running or whether it is used in starting the engine. Which is to say there are no clutches or governors between the engine and the dynamo, the dynamo starting the engine directly through the timing gear train. When the engine starts, the dynamo automatically takes up its battery charg-

ing load, and is automatically cut out when the engine stops.

Garford Cars—Power Range, 30—50 Horsepower; Price Range, \$3,200—\$5,750.

Backed by an enviable reputation for consistency, Garford is another name that stands for all that is right and proper in motor car construction. During the past year the line has been increased by the addition of two new models, a "four" that is rated at 30 horsepower and employs a motor of $4\frac{1}{4}$ inch bore and $5\frac{1}{4}$ inch stroke, and a six-cylinder chassis in which a motor of the same dimensions is used. The original four-cylinder 40-horsepower car, styled model GA, is continued in much its original form, little room for improvement having been found in a chassis which has proven eminently satisfactory during a long term of years. Garford construction, which has been productive of unusually satisfactory results, is featured in both the new models, the transmission elements including the



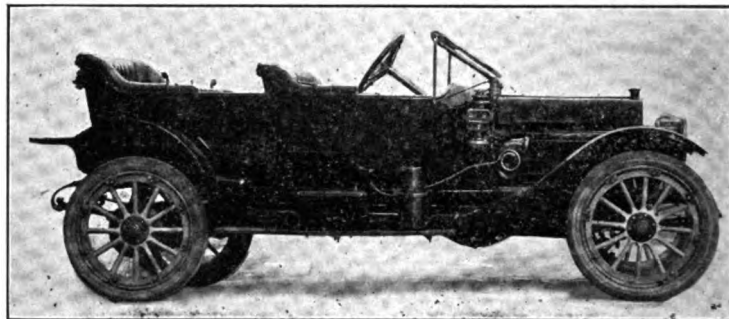
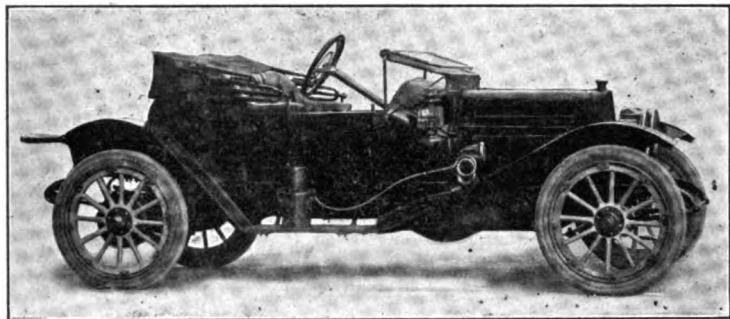
GARFORD COMPRESSION RELEASE

same large cone clutch, similar four-speed selectively operated change gear mechanisms in which direct drive is the third speed, full-floating rear axles and equipment that is more than ordinarily complete. One of the later features of the new models is the addition of a power driven tire inflating pump operated from the front end of the gear box. A small lever outside the frame serves to connect or disconnect the pump, which is driven through gearing, and the air pipe is located in a position to be accessible for both front and rear tires. The older car also has been made more complete by the addition of a similar tire pump, though instead of being located on the transmission it is positioned under the engine hood and is driven from the engine itself through the intermediary of suitable gearing. The ignition system on the "six" also has been changed slightly and now is really two independent Bosch high tension systems operating through separate plugs. Another of the little refinements which indicates Garford policy to produce the best, with a capital B, lies in the enclosing of the valves by means of metal covers.

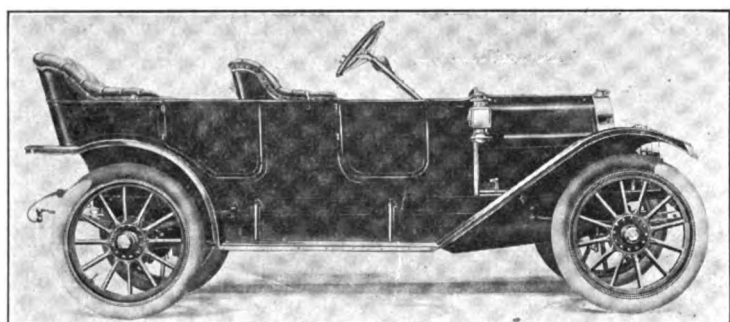
Chalmers Cars—Power Range, 30—50; Price Range, \$1,600—\$3,250.

With a brand new six-cylinder model, which just has been added, and another new four-cylinder model as well, the Chal-

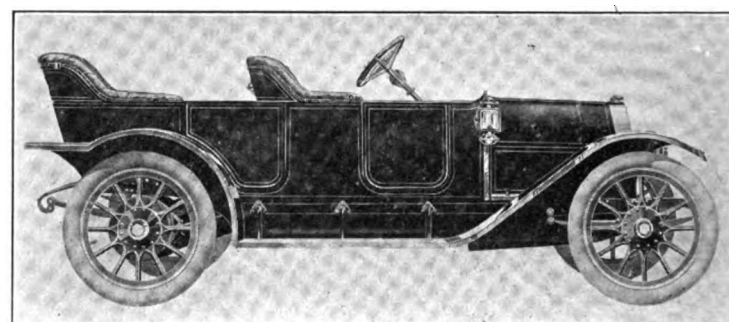
SOME OF THE MANY NOTABLE CARS EXHIBITED AT THE MADISON SQUARE GARDEN SHOW



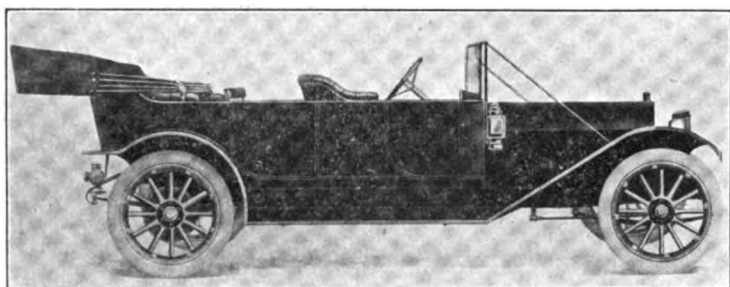
E-M-F "30" IN ROADSTER AND TOURING CAR FORMS



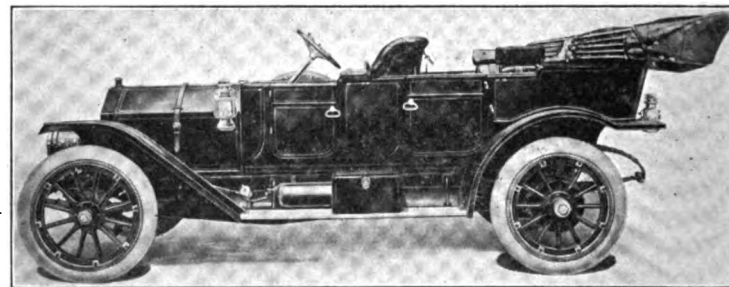
OVERLAND 30-HORSEPOWER TOURING CAR



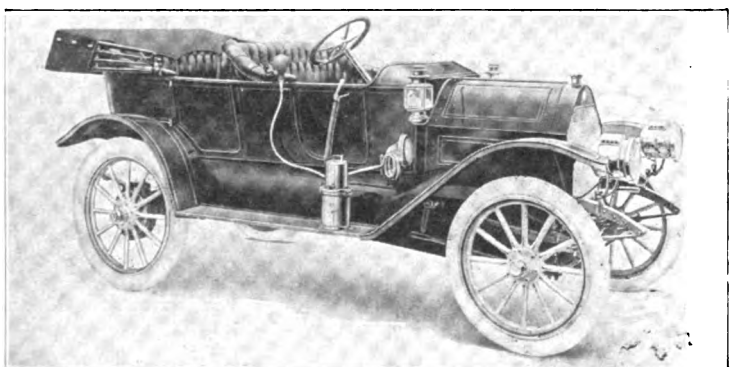
OVERLAND 35-HORSEPOWER TOURING CAR



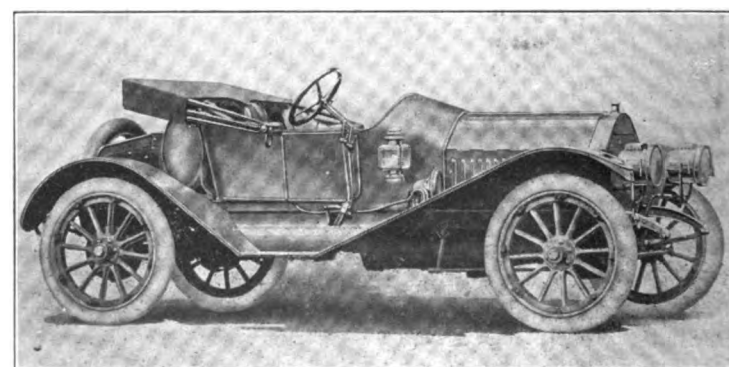
PULLMAN 60-HORSEPOWER "SIX"



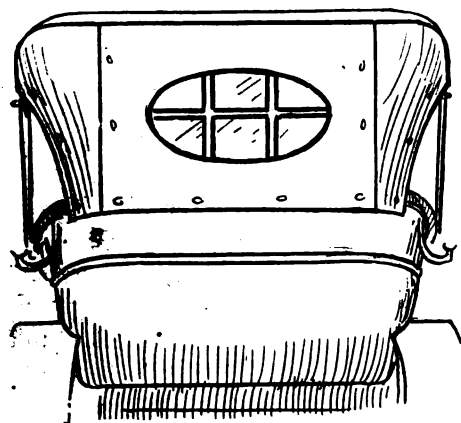
PULLMAN 50-HORSEPOWER "FOUR"



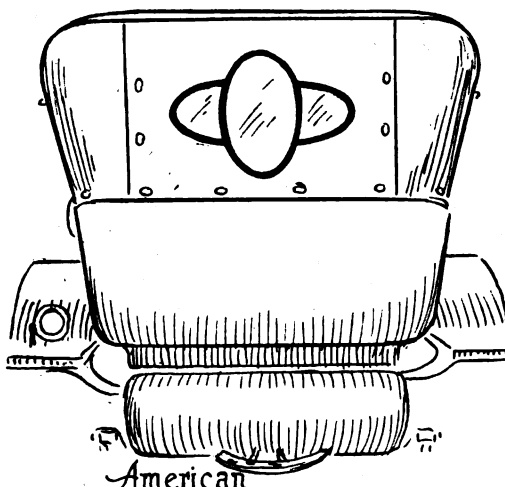
MAXWELL MASCOTTE, 25 HORSEPOWER



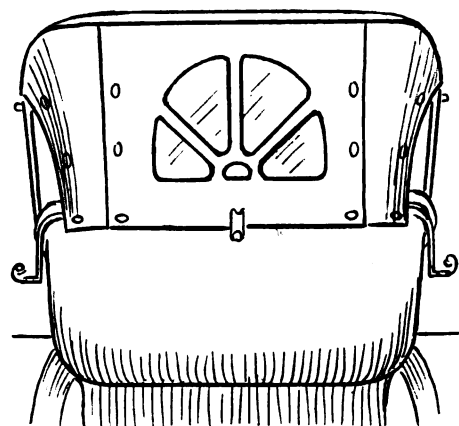
MAXWELL MERCURY, 28 HORSEPOWER



Marmon



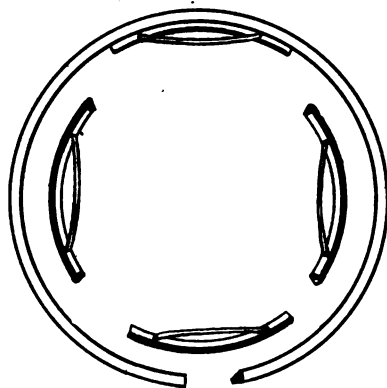
American



Overland

mers line which started originally with two four-cylinder models of 30 and 40-horsepower, respectively, and which has gained an enviable reputation in the past few years, offers intending purchasers no small variety for choice. Naturally, considerable interest attaches to the older 30 and 40-horsepower models by reason of their past performance and their record for consistency and reliability, though chief interest centers around the two new productions, which, while reflecting many of the characteristics of their predecessors, still incorporate a sufficient number of distinctive features all their own to make them of more than passing interest. The new four-cylinder model is styled by its producers the "Thirty-Six" and like the 30-horsepower model has its cylinders cast in a single block. The cylinder measurements are $4\frac{1}{4}$ inches bore and $5\frac{1}{4}$ inches stroke, the same dimensions applying also to the new "six." Both of the new cars are equipped with an engine starting device of the same type designed and constructed in the Chalmers shops. It is of the compressed gas type, burned gas from one of the cylinders being stored in a cylindrical steel tank from which it is piped to the cylinders after first passing through a rotary distributing valve which admits it to each cylinder in rotation as its piston comes first in-

to the firing position. A small button on the dash serves to liberate the gas and immediately the engine starts the storage tank is replenished ready for the next start. To assist those who are not mechanically in-



CHALMERS PISTON RING

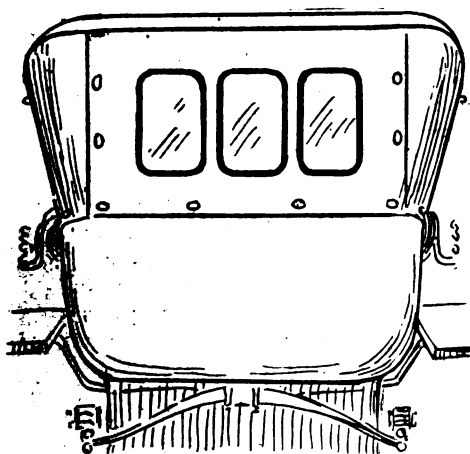
clined in grasping its essential features, which are particularly simple, a working model of the starter furnished ample amusement for the patient demonstrator and ocular proof of its dependability.

Marking a divergence from previous Chalmers practice, the six-cylinder chassis is equipped with a change gear mechanism in which four forward speeds are provided;

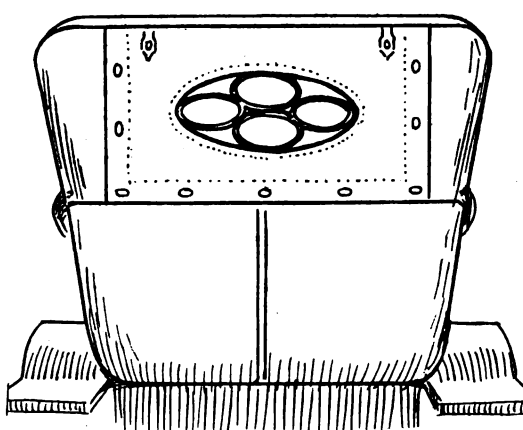
it is selectively operated. In the evolution of the "Thirty-Six," the manufacturers have endeavored to produce a chassis unsurpassed from the mechanical point of view and to this end not even the most inconspicuous part has been overlooked or slighted. One of the seldom thought-of features of all gasoline motors which has come in for its quota of attention are the piston rings which are of a totally new and unusual type calculated to eliminate the possibility of smoking and at the same time preserve the necessary compression under practically impossible conditions. The rings are triangular in shape with the apex of the triangle toward the center of the piston. There is, therefore, a certain amount of space between the pointed part of the rings and the slots into which they fit, and in this space there are fitted triangular segments which hold the rings firmly against the sides of their slots and the cylinder walls.

Packard Cars—Power Range, 18—48; Price Range, \$3,200—\$5,000.

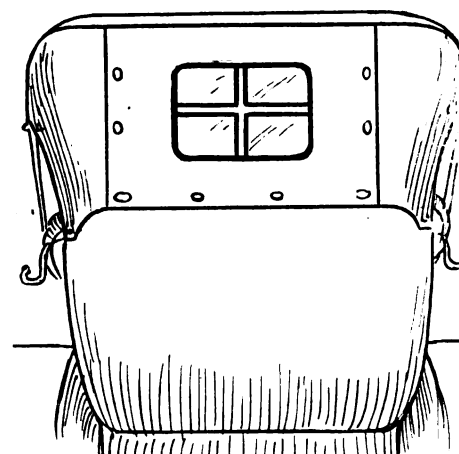
There are two palpable reasons for the presence of but a single Packard car, and one polished chassis at the stand of the widely-known manufacturers of this particular brand of car. The first of them is that both car and chassis are the newest



Lozier



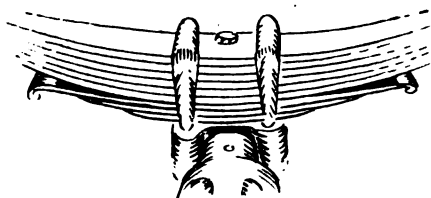
Selden



Franklin

REAR VIEWS OF WELL-KNOWN CARS AND TOP PATTERNS THAT DISTINGUISH THEM

product of the Packard factories and exemplify the latest engineering practice in six-cylinder design and construction, and the second is that as all Packard cars are substantially alike in their essential features, saving only a difference in the size of parts commensurate with the three sizes of motor used, the two exhibits serve to make plain the distinctive points of all. There are slight differences in the three chassis, of course, though as has been stated previously, fundamentally they are the same. Thus, for instance, the design of the rear axle of the new six is slightly different from the one which is used on the older "30." Instead of being in two sections bolted together vertically, it is a one-piece housing which construction contributes materially to the cause of accessibility inasmuch as the differential mechanism can be gotten at without the necessity of removing a considerable number of bolts. Another little difference in construction is noticeable in the spring suspension, both front and rear springs being equipped with several auxiliary leaves below the ordinary ones, the extra leaves only coming into play when the car is heavily laden or when un-



PACKARD AUXILIARY SPRINGS

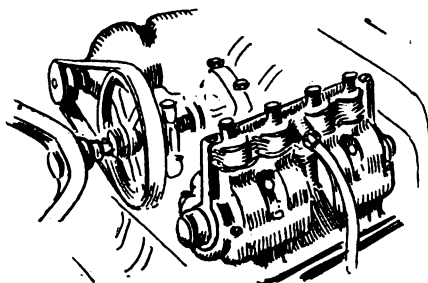
usually severe road conditions are met. The cylinders of the six are cast in pairs and the distinctive Packard unit power plant suspended at three points has been retained. The flywheel is enclosed in a housing which is an extension of the crankcase and a multiple disk clutch is carried in the flywheel. As heretofore, the Packard car is one of the few remaining exponents of the progressive type of change gear mechanism. Three speeds forward and reverse are provided and the speed changing gears are enclosed in a single housing common to them and the differential mechanism. The single car that is exhibited is a four-passenger phaeton finished in maroon and black in a style that becomes the reputation of the builders for richness and beauty. It is mounted on the six-cylinder chassis and the tonneau is upholstered in broadcloth and tastefully fitted out with the usual equipment for the comfort of passengers.

Columbia Cars—All 38 Horsepower; Price Range, \$3,500—\$5,800.

By the adoption of a Knight engined chassis, the Columbia line has been rendered radically different within the past year, and now includes but two chassis, one of which employs the conventional type of poppet valve motor. Though both motors are rated the same, namely, 38

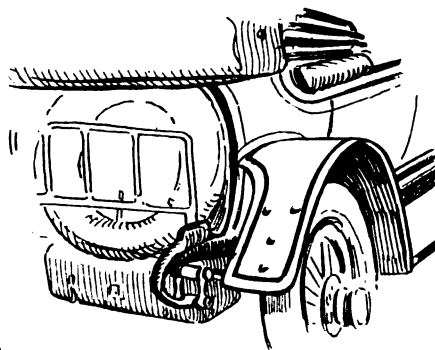
horsepower, their dimensions differ slightly, the Knight engine measuring $4\frac{1}{8}$ inches bore and $5\frac{1}{8}$ inches stroke, and the poppet valve engine having the same bore but a stroke of $5\frac{1}{2}$ inches. The apparent discrepancy suggested by the same rating and the different cylinder dimensions is made plain, of course, by the larger ports provided in the Knight engine and the fact that its construction permits of more accurately timed valves.

Though the Columbia-Knight motor is fundamentally the same as others of the same type, it differs slightly in regard to



COLUMBIA PUMP AND DYNAMO

the construction of its essential features. Thus, for instance, the combustion space has been modified slightly to permit the location of two spark plugs in each cylinder head. Otherwise, the motor is practically the same as those that are used in other standard American cars. Other than the unique principle on which the motor operates, probably its most noteworthy feature is the oiling system which is used.



COLUMBIA-KNIGHT TIRE RACK

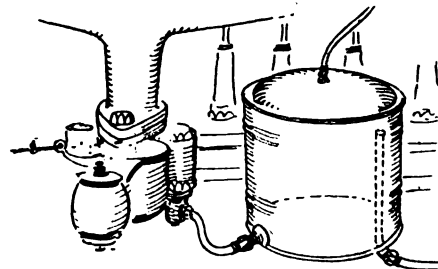
Below each connecting rod big end bearing a small, narrow trough serves to contain a quantity of oil into which a small scoop dips. The peculiar part of the system lies in the fact that the troughs are hinged at one end and are so connected with the throttle lever that as the throttle is opened the troughs are moved upward permitting the scoops to dip deeper and supply the motor with an increasing quantity of oil as the speed of the engine increases.

The poppet valve chassis, which is styled the "Cavalier," discloses little in the way of innovations, though it has suffered a thorough refinement calculated to render it more efficient than ever and more silent in operation. Helical timing gears now are used and the shafts and bearings have been

increased in size. The shape of the piston heads and the combustion chamber has been altered slightly to permit the throttle being opened fully with the spark in full advance position without danger of knocking. A pressure operated fuel feed system has been added and the equipment of the several cars of the line has been made more complete.

Speedwell Cars—All 50 Horsepower; Price Range, \$2,500—\$3,850.

But one new model has been added to the long line of cars built by the Speedwell Motor Car Co., of Dayton, Ohio—a low-hung high-speed four-passenger car of the so-called "demi-tonneau" type on a 50-horsepower chassis with a wheelbase of 123 inches. The same motor is used in all of the twelve models constituting the Speedwell family, and it has been changed only in some minor aspects, with a view to securing particularly quiet operation. Valve-lifting rollers have been increased in diameter until they are now larger than the cams themselves and the valve stems and guides



SPEEDWELL CARBURETTER TANK

are larger than before. The entire valve mechanism is enclosed. The water pump, oil pump and the high-tension magneto are all driven by noiseless worm gearing, and close fitting throughout the motor tends to keep down rattling and back-lash. The gasoline tank is hung in the rear and gasoline is forced forward by air pressure; a little gauge on the dash indicates the pressure. Gasoline is fed to a little auxiliary tank near the carburetter, from which it flows by gravity to the carburetter. Prest-O-Lite self-starters are standard equipment on all models.

Other mechanical changes include the substitution of annular ball bearings for the roller type formerly employed in the gearcase; an increase in the size of the gear shafts and also of the gears themselves, and the use of spring devices to prevent the rattling of the brakes. In many parts heretofore finished in polished brass black enamel is used. Practically the only variation in the entire twelve models, apart from the bodies, is that the wheelbase of one, the four-passenger "Cruiser," is 132 inches instead of the standard 123 inches.

Stevens-Duryea Cars—Power Range, 36—54; Price Range, \$3,750—\$5,000.

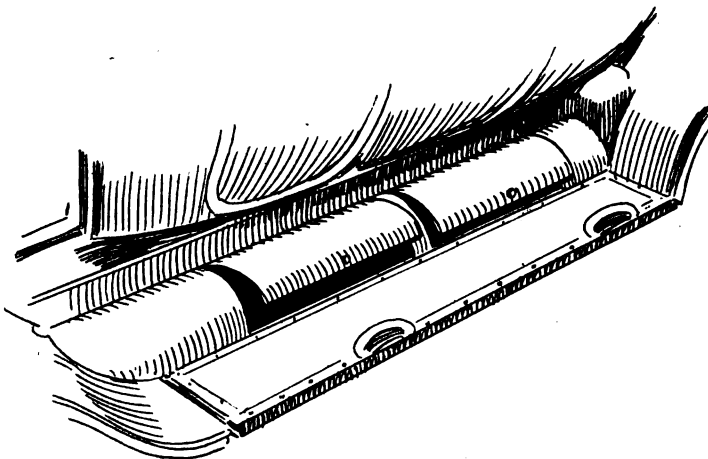
Not all manufacturers incline to the belief that it is possible so to construct a chassis frame as to make it impervious to

a certain amount of "weaving" under other than ideal road conditions. Stevens-Duryea cars are built on this principle, and it is interesting to note that since the distinctive unit power plant and its method of support at three points was adopted years ago, the same method of construction has been used with but very slight modification. This year there has been even less change in details than ever before which goes far toward proving the wisdom of the manufacturers as exemplified in their original construction. Under what one show-

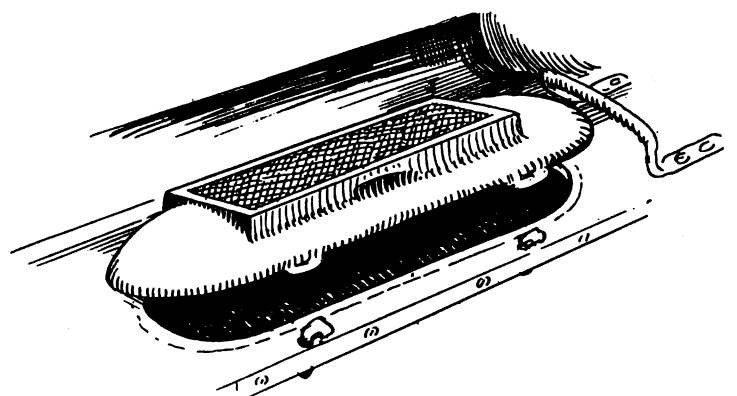
The patented dry plate multiple disk clutch is retained as is the three-speed change gear mechanism and such alterations as have been made in the construction are of such purely minor character as to be almost insignificant. The most noteworthy one embraces the adoption of a new Bosch ignition system which is really two independent systems. Refinements are really in the form of additions to the already liberal equipment. Thus, for instance, all models are equipped with motor starting devices of the acetylene type, and

olene tank is at the rear and instead of being round is simply quarter-round, there remaining more than the usual amount of space for the storing of tools and spare parts in the compartment from which the type of body takes its name. The body and chassis are beautifully finished in a new color which is styled by the artists who evolved it "Vin de Mulbury." To those who are not acquainted with all the colors that may be produced by a combination of the various elements of the spectrum it might be said in passing that "Vin de Mul-

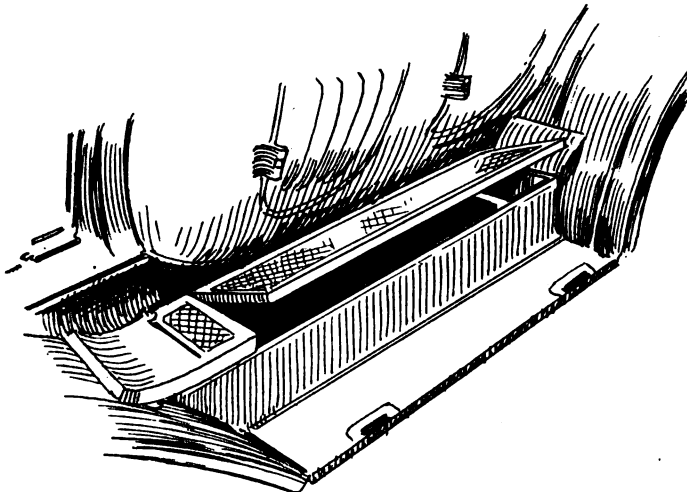
VARIETY IN THE METHOD OF STORING TOOLS AND TANKS



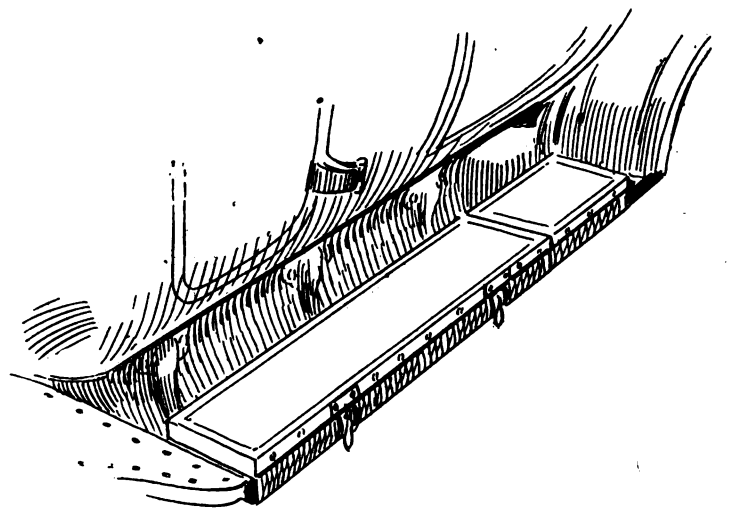
KNOX RECEPTACLES BEHIND RUNNING-BOARD



LOZIER COMBINED TANK CASE AND STEP



FULL LENGTH COMPARTMENT ON OLDSMOBILES



OVERLAND TOOL TRAY UNDER RUNNING-BOARD

goer styled a "naked" chassis, the term signifying that the chassis had been polished and prepared especially for the edification of those who cared to pry into it in detail, have been arranged the elements of the driving mechanism including the driving members of the motor, the change gear mechanism, the propeller shaft and the rear axle in the relative positions they occupy in the finished chassis. The object of the display is to make plain the distinctive and exclusive method of interconnecting the component parts by means of square and taper-square joints, and the elimination of keys and pins.

each carries a four-cylinder tire inflating pump arranged to be driven from the timing gear train at the front of the engine.

As usual the various types of bodies that are fitted to the three chassis are sumptuous, to say the least, and one new model has been added. It is an exceptionally roomy roadster of the so-called compartment type, mounted on the AA or 43-horsepower chassis, and it incorporates a number of unusual features. Thus, the top, which is a snug fitting two-bow affair, has a wooden edge at the front which comes down to the folding windshield to which it attaches by means of latches. The gas-

bury" is a new shade of brown, the entrancing effect of which is heightened by broad black striping edged with gold. Of a limousine body tastefully done in another new shade which is styled Wildwood Violet and which is striped with ivory white, the producers are particularly proud, for it is said that the color scheme which is carried out, both outside the body and inside it, necessitated a trip to England. The upholstery is embossed doeskin delicately figured in violet to match the outside paintwork. Lace and silk curtains and the usual complement of toilet and boudoir fittings lend an undeniable air of luxury. Not sat-

ished with two new shades, still another has been evolved and is displayed on a closed-front flush-sided seven-passenger touring car. It is styled Opaline blue, and takes its name from the iridescent character of the hue which changes according to the angle from which it is viewed. Enhancing the general appearance of the car, nickel plated trimmings are used throughout.

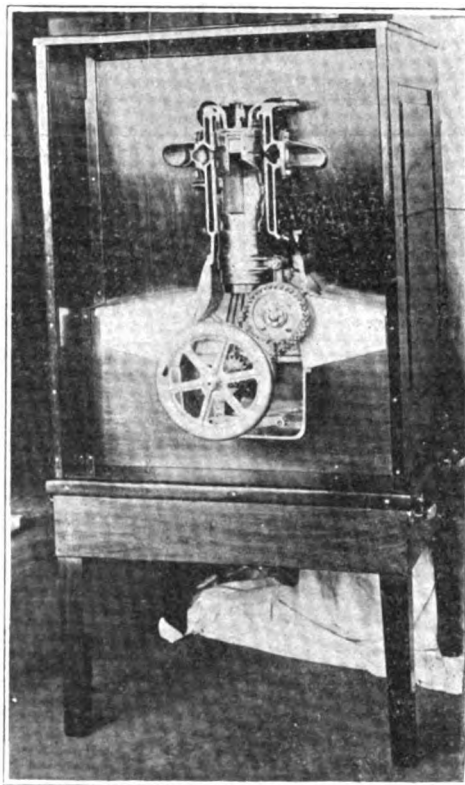
Stoddard-Dayton Cars—Power Range, 28—70; Price Range, \$1,350—6,250.

With the distinction of including the only six-cylinder Knight-engined chassis at the show, or for that matter in America, and it might be said in passing as well, that there are very few of them manufactured abroad where the Knight engine first received the impetus that carried it back to home shores, the Stoddard-Dayton line is of surpassing interest, and is of unusual completeness inasmuch as another new poppet valve model has been added as well. The line embraces no less than four sizes of poppet-valve-engined chassis, viz., the Saybrook in which a four-cylinder valve-in-the-head motor measuring $4\frac{1}{4} \times 5$ is used, the Stratford, in which a four-cylinder L-head motor measuring $4\frac{1}{8} \times 5\frac{1}{4}$ is used, the Savoy in which a four-cylinder L-head motor measuring $4 \times 4\frac{1}{2}$ is used, and the Courier which mounts a four-cylinder motor with cylinders of $3\frac{3}{4} \times 5\frac{1}{8}$ inches, bore and stroke, respectively. Individually and collectively, the various poppet valve models incorporate many distinctive features—features that long have been associated with the high standard of merit which the manufacturers of Stoddard-Dayton cars have set and maintained—though, as is the case in so many other brands of car, little room for improvement has been found. Wheelbases and tires sizes have been generally increased, and the Stratford models have been improved by the adoption of full-floating rear axles. One new feature that is common to both the Knight, Saybrook and Special models is the use of a new form of exhaust manifold in which the ejector principle is employed. Which is to say that the inside of the manifold is so formed that the exhaust from one cylinder tends to create a vacuum which assists in the evacuation of the burnt gases from the others. Carburation, too, has been rendered more perfect by the addition of a manually controlled auxiliary air intake.

Aside from the fundamental principles of the Knight motor, the Stoddard-Dayton six-cylinder model possesses a number of unusual features all its own. To those who, perhaps, are not as familiar with the Knight principle as they might be, it might be well to add that in place of the usual poppet valves which govern the admission and exhaust of gases the Knight engine employs two concentric sliding sleeves which line the cylinder, and against the inner one of which the piston slides. The

sleeves are actuated by means of small cranks which receive their motion from a common shaft similar to the shaft which mounts the valve lifting cams in a poppet valve motor. In realization of the fact that the principle is more or less hazy in the minds of some, a sectioned Knight cylinder showing the working parts—worked by those who care to turn a nicked wheel—and illuminated by tiny electric lights which delineate the functions, is exhibited with the Stoddard-Dayton cars and it never fails to draw a crowd.

The cylinders of the Stoddard-Dayton



SECTIONED STODDARD-KNIGHT CYLINDER

Knight are cast in threes with individual intake and exhaust ports to facilitate the passage of the gases. The crankshaft is of exceptional diameter and is supported in seven bearings to eliminate the possibility of bending strains. Further increasing the silent action of the motor, the crankcase is fitted with coreways through which the air passes before entering the carburetter. Incidentally this feature assists carburation for the reason that the air is pre-heated. Only one Knight-engined car is shown, and this is a luxurious-appearing limousine which partakes of some of the features of the Berline type in that the driver's compartment is more than half enclosed in glass. The effect is heightened by the front doors which are of unusual height. Left hand drive with centrally located control levers is a feature of the car, as it is of all the other Knight engined models which are produced.

The bodies of all the cars, whether equipped with poppet valve engines or

Knight engines have been widened, and in the Knight Saybrook, and Special models, the comfort of occupants of the front compartment, particularly the driver, is further increased by the feature of adjustable seats, which may be moved backward or forward within certain limits to accommodate persons of differing leg lengths.

Stearns Cars—All of 28 Horsepower; Price Range, \$3,500—\$5,300.

Raised high above the heads of the gazing crowds, a polished Knight sleeve valve motor looks every inch the Keystone of the Stearns display, and that, in sober fact, is what it really is; for as the world knows, it has displaced the poppet valve motor entirely so far as Stearns productions are concerned.

Not only has the Stearns company adopted the Knight engine as its only type of motor, but it is pinning its faith to a single size, $4\frac{1}{4} \times 5\frac{1}{4}$, rated at 28-horsepower, and building all its models on a single chassis which varies only in the matter of wheelbase, which is 110 inches for the roadster and the demi-tonneau, and 120 inches for the touring car, the limousine and the landaulet. This in itself is a notable change, as last year two distinct chassis were shown and the purchaser was given an option, on the larger size, of either chain or shaft drive; this year the shaft drive is as supreme at the rear end of the car as is the Knight motor at the front.

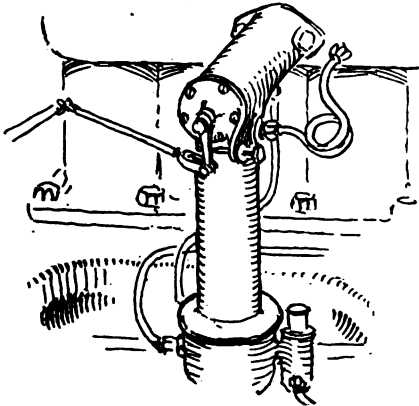
The Stearns car always has been a machine of particularly sturdy construction, and this year's model is by no means an exception to the rule. The rear axle, to cite a vital part of the car's anatomy as an example, is of remarkably substantial build. The housing consists of a single steel forging with an open center for the accommodation of the differential and bevel gears. The extending arms are bored for the passage of the driving shafts and, on the outside, are machined true to form mountings for the bearings of the wheels. The three-speed selective change gears and the differential are enclosed in a cast case bolted to the main axle forging and supported by it; these casings are not relied upon to lend strength to the axle, as it is in itself amply able to carry its load, with a wide margin of safety, but are merely housings carrying the gear shaft bearings.

While the Stearns company has gone into the engineering end of motor car building with a thoroughness that is sufficiently attested by the performance of its cars, the more luxurious aspect of motoring has not been neglected; in fact, the same spirit of thoroughness can be traced throughout the car. To cite another concrete instance, it may be said that the Stearns company was one of the very first to send out its cars with full equipment—that is, something more than the tools and jacks absolutely necessary to the operation of the car. The Stearns car of 1912 will go into its purchaser's hands with a silk mohair top, au-

tomatic windshield, demountable rims, electric lighting outfit with generator, Klaxon horn, muffler cut-out and the usual tools; it will be "ready to run" in all truth.

S. G. V. Cars—Power Range, 25—35 Horsepower; Price Range, \$2,200—\$2,750.

Frank acknowledgment is made by the manufacturers of S. G. V. cars of their debt to a prominent foreign builder, inasmuch as these cars are practically reproductions of cars which contain a number of features that are as much of proven worth as they are of unusual character to other American-made vehicles. The original 25-horsepower model, which first made its appearance about a year ago, when the Acme Motor Car Co., of Reading, Pa., was reorganized and renamed for the express purpose of the production of S. G. V. cars, is continued without material change. A new model, identical with the other except



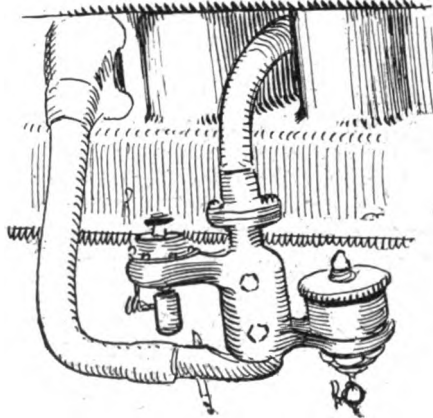
S. G. V. INTAKE PIPE

as regards the dimensions of its motor, which are $4 \times 5\frac{1}{4}$, rating 35 horsepower, has been added. It incorporates the same block motor with set spark ignition, multiple disk clutch, four speed change gear mechanism and full-floating rear axles as its older brother. The first glance at either of the two chassis conveys the impression of extreme simplicity, and as a matter of fact the manufacturers have concentrated on the elimination of as great a number of parts as possible as one of the most direct roads to highest efficiency. The dash, in particular, reveals the undeniable simplicity of the whole, for it contains nothing more than a small oil pressure gauge. A pretty maroon landaulet, one of the few that are exhibited at the show, and a low-hung, racy-appearing four-passenger closed front touring car, together with the two chassis, comprise the exhibit.

Everitt Cars—Power Range, 30—48 Horsepower; Price Range, \$1,250—\$1,850.

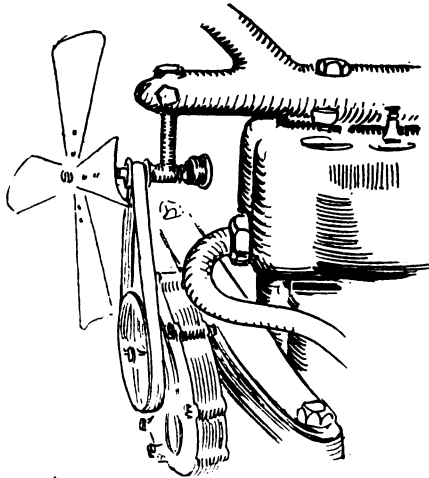
There are only two six-cylinder cars at the show in which all the cylinders are cast in a single block, and the Everitt is one of them. In addition, it has the distinction that integral with the single casting of wonderful intricacy is the upper half of

the crankcase, which construction is exclusive with this particular brand of car. Needless to say it contributes materially to the rigidity of the motor and consequently depreciation is lessened. To those who might, perhaps, look askance at the practice of casting so large a motor in a single block, on the grounds that its replacement in case of accident must necessarily be expensive, it is pointed out that such is not the case. The very rigidity of the casting



EVERITT CARBURETTER LOCATION

itself practically precludes the possibility of fractures, and even if replacement should be necessary the cost is purely nominal and stands at \$50, the casting being finished ready to fit into place. Of the three models that comprise the line, two of them, the "six" and another "four" that is quite similar to the older model, are new and reflect the usual Everitt thoroughness and

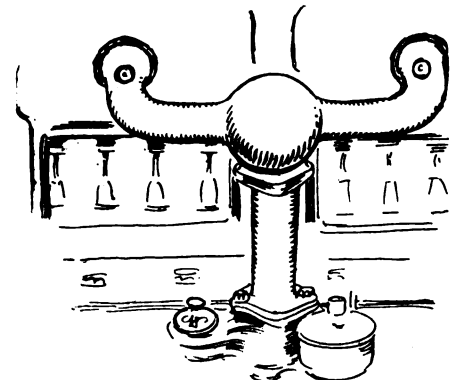


EVERITT FAN BRACKET

thoughtfulness in design. As a matter of fact, the two four-cylinder motors are alike as regards their cylinder dimensions, both measuring $4 \times 4\frac{3}{4}$ inches. The older motor is rated at 30 horsepower, and by reason of an enlargement of the valves and gas passages in the new four-cylinder engine even the new rating of 36 horsepower which it takes is on the conservative side. The cylinders of the six-cylinder motor are of the same dimensions as those in the other two. There are several points about it

which are distinctly worthy of note, not the least of them being the method of mounting the carburettor on the opposite side to the intake manifold. The intake pipe leads between the third and fourth cylinders, which are cast with an opening between them to permit of an exceptionally large center crankshaft bearing. Another of its interesting points is the form of the water manifold at the top of the engine. It is merely an elongated flattened aluminum casting, held in place by means of bolts which pass through it into the cylinder casting. At the front end it is carried out to form the fan bracket, as shown in the accompanying picture.

The usual assortment of touring, roadster and enclosed bodies are supplied on all of the three chassis, and they are exceptionally roomy and comfortable creations with flush sides and concealed door latches and hinges. One of the later arrivals is a commodious compartment roadster that



SELDEN INTAKE PIPE

bids fair to rival the other cars in the line in the point of future popularity. It is mounted on the six-cylinder chassis and is equipped with a new style of top which connects with the top of a folding windshield to form in effect a miniature closed body that suggests the acme of comfort.

Selden Cars—All of 40 Horsepower; Price Range, \$2,500—\$3,750.

The Selden car is represented by a single chassis, with-cylinder motor of 40-horsepower, upon which the five models forming the Selden company's line are mounted. While the design of the chassis has been overhauled to see what points could be strengthened or improved for the current year, the changes were few, and the machine stands practically as it was in 1911. The most important detail alteration is the clutch, which has been changed from a leather-faced cone to a multiple disk, with dry plates; there are 13 plates, the driving plates being faced with Raybestos and the driven disks left bare. Last year's semi-floating rear axle has given place to a full floating axle fitted with ball bearings; the differential is carried by Hyatt high duty roller bearings with ball thrusts. The drive to the wheels from this axle is not through the wheel hups, but through

wide flanges through which the hub bolts pass. An unusual arrangement of the brakes is adopted, consisting of placing both emergency and service brakes, which are expanding rings, within a single broad drum side by side. The result is that the braking surfaces are equal in both cases, and both are enclosed.

A distinctive feature of the Selden motor is the form of the intake manifold. This is of a general T shape, a branch going from the central riser to each pair of cylinders. At the junction of the T there is a large spherical chamber, the object of which is to form a space large enough to hold a considerable volume of gas which, by its swirling and churning, will become thoroughly mixed before passing to the cylinders. The valves of the motor are all enclosed and are on the left side; the exhaust pipe is carried high so that the stems and springs can be reached without difficulty, and this is not interfered with by the intake pipe, which clears them.

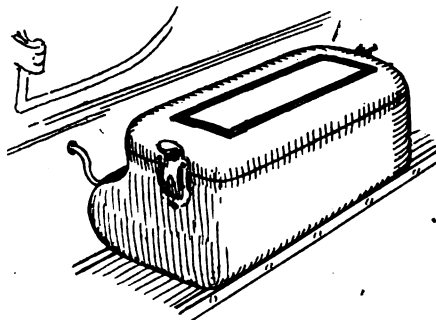
Franklin Cars—Power Range, 18—38; Price Range, \$1,650—\$5,000.

As was the case at last year's show, the Franklin company is the only one exhibiting cars employing air-cooled motors. And the Franklins in evidence differ materially from their predecessors, except in one respect; they are minus the auxiliary exhaust valve. It is explained that in making this change the efficiency of the motor has not been lessened in any degree, but, rather, has been increased by the elimination of parts that were found to be unnecessary.

The six-cylinder motor of the largest Franklin car, Model H, is remarkable in that despite the trend of the trade to long strokes, the stroke of this Franklin has been shortened to four inches, and now is 4 x 4 instead of 4½ x 4½, as formerly, and rated at 38, instead of 48-horsepower. The price, too, has been changed, being \$4,000 instead of \$4,500. Model D, the five-passenger touring car, has the same motor as Model H. An increase of eight inches has been made in the wheelbase of Model M, the 30-horsepower "light six," the measurement now being 116 inches, and the four-cylinder type, Model G, is made in two styles, a two-passenger runabout of 18-horsepower and a five-passenger 25-horsepower touring car.

Next to the abandonment of the auxiliary exhaust, the most important change consists in the use of a self-contained lubricating system in which a pump forces oil through separate ducts to each of the main bearings, whence it passes through holes drilled in the crankshaft to the crankpin bearings and there overflows and is thrown to all parts of the interior of the crankcase, oiling the cylinders and valve mechanism. The oil well extends the full length of the four-cylinder motors and under the four rear cylinders of the "sixes" and the entire opening at the top of the well is covered with wire gauze. Slight

gearbox changes permit the gear shifting and emergency brake levers to be placed closer to the driver's seat, where they are more easily manipulated than formerly. Manual spark control is eliminated in all models, the runabout retaining the fixed spark magneto and the ignition on the larger cars being controlled by governors acting on the magneto armatures. Means for adjusting the mixture and for regulating the hot and cold air from the driver's seat are retained. By means of a novel valve, the gasoline tank can be drained or the food set for "main" or "emergency," or shut off, at the driver's will. Carburettors are unchanged save for the adoption of automatic auxiliary air valves tending to give a more uniform mixture at varying motor speeds, and these are found only on the "sixes." Body changes are not radical and are of a character to enhance the comfort of passengers. This



FRANKLIN TOOL BOX

end is served in no small degree by a second wind shield mounted on the back of the front seat.

Lozier Cars—Power Range, 46—51; Price Range, \$4,100—\$7,000.

Except for the fact that it radiates Lozier quality and presents the usual Lozier pugnacious appearance, it might perhaps be difficult for the average person to identify a big, imposing double limousine which stands, totally divorced from the rest of the Lozier exhibit, over in a corner and nearly under the stairs leading to the balcony. It scarcely can be missed, even by the most casual observer. It is done in a pleasing combination of brown and black, and the usual bright work has been more or less subdued to impart an undeniable air of quiet and refinement. In the matter of its essential elements, which means the chassis and the power plant, it is substantially the same as its immediate predecessors, though it differs radically in one respect, viz., the steering wheel is placed at the left side with the control levers in the center of the floorboard. Left-hand steer with centrally located control levers, it is explained, hereafter will be a feature of all the Lozier limousines that leave the factories, unless, of course, the other arrangement is specified. This does not mean, however, that the regular touring cars and roadsters will be equipped with

left-hand steering wheels; except in the limousine bodies the control elements will remain the same as heretofore. In addition to the double limousine, which is mounted on the six-cylinder chassis, there is a racy-appearing four-passenger small tonneau touring car mounted on the four-cylinder 46-horsepower and six-cylinder 51-horsepower, being the only ones that bear the Lozier brand. The touring car body is finished in dark brown and the running gear is canary yellow, which combination tends to accentuate the clean-cut appearance of the whole. One of its novel features, and one which speaks for the thoughtfulness of the designers, is the housing of the Prest-O-Lite tank in a receptacle that is half above and half below the running board; the top of the housing is flattened and corrugated to form a convenient step. Mechanically, the cars have changed only in slight degree and in such manner as scarcely to be worthy of mention. The same well-known features including multiple disk clutch, four-speed selectively operated change gear mechanism, full-floating rear axles and three-quarter platform rear springs are retained without change.

Pope-Hartford Cars—Power Range, 50—60; Price Range, \$3,000—\$5,950.

Probably the most noteworthy divergence from previous practice as exemplified in the Pope-Hartford cars, and barring a general improvement in body styles whereby the line as a whole has taken on an added touch of style and comfort, practically the only one that is visible on first inspection is the substitution of three-quarter elliptic springs for the semi-elliptic members which in the past have served to support the rear of the chassis. In reality, however, the revision that has been made has reached considerably deeper into the vitals of the two chassis that comprise the line, though in the main the general principles of Pope-Hartford construction followed so successfully in the past have been adhered to. The body changes that have been made are largely in the way of refinements, and though such apparently minor alterations as the locating of the tool boxes in the rear instead of on the running-boards, a slight change in the shape of the mudguards, improved running-boards and the adoption of detachable front doors scarcely are noticeable, they nevertheless reflect the endeavors of the manufacturers to make an always dependable and pleasing car even better. Three new body styles have been added to the line and include limousine, an enclosed roadster and a five-passenger phaeton; all are supplied on either the four or six-cylinder chassis, according to the tastes or requirements of the individual purchaser. Though the design of the rear axle always has proven dependable, strut rods have been added by way of precluding even the remotest chance of trouble in this direction. The lubrication system has been modified

slightly by way of insuring the absence of smoke under all conditions and a clutch brake has been added to facilitate quiet and easy gear changing.

E-M-F Cars—All 30-Horsepower; Price Range, \$1,100—\$1,475. **Flanders Cars**—All 20-Horsepower; Price Range, \$800—\$1,050.

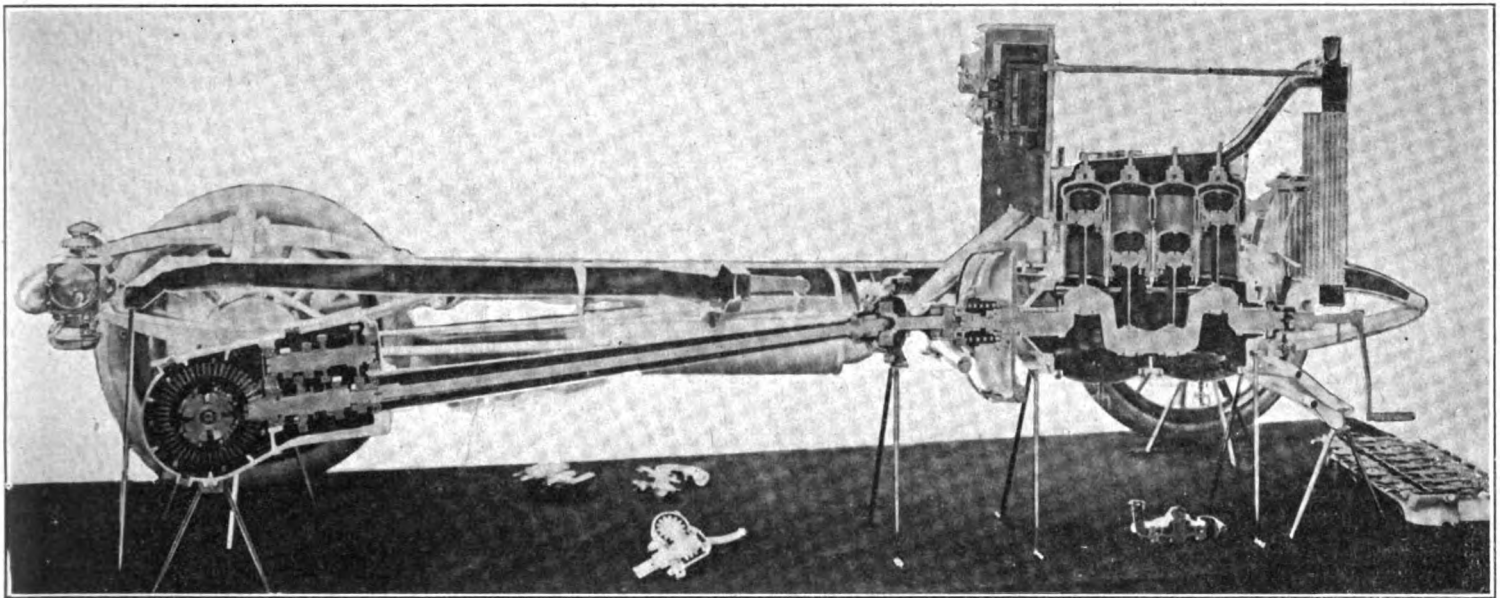
E-M-F and Flanders cars are shown together as becomes these two striking productions of the same company, the Studebaker Corporation. And if they have become more than ever alike externally, both revealing careful thought in constructional details and cleverness in finish, evidence of even greater similarity becomes apparent upon deeper investigation. The E-M-F

so many excellent points about this big little car that it has been thought expedient to exhibit a complete chassis cut straight through the center, so that visitors may see for themselves just how the component parts are constructed, and how they are assembled to make a whole that fairly bristles with such features as usually are confined to cars far above them from the point of price classification. The halved chassis—not a few have remarked its resemblance to the half of a boiled lobster, the reason being that the insides of the cylinders and at other points where sliding contact is not made are painted a bright red—never fails to attract a throng. In fact, the attention of visitors has become so insistent that as early as Monday afternoon it was

answer to the eternal "How?" is: "Every part was sawed through separately, ground, and put together afterward with the help of solder and hidden pins."

Palmer-Singer Cars—Power Range, 40—60 Horsepower; Price Range, \$2,000—\$3,000.

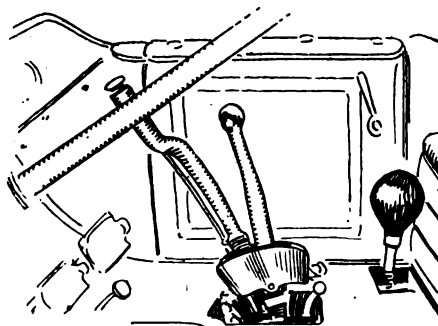
Among the very first of the motor car builders to adopt the so-called "gunboat" type of body, the predecessor of the "torpedo," and always noted for the "classy" appearance of its cars, the Palmer & Singer company's newest product is well calculated to uphold that reputation. And not only has appearance been studied, but comfort as well, as is indicated by springs of great length with thin, lively leaves, and



THE FLANDERS HALVED CHASSIS WHICH SHOWS THE CAR'S VITALS IN DETAIL

cars remain substantially the same, except for several slight rearrangements of elements to increase the smoothness of action and the uniformity of performance of the whole, but the Flanders cars have been more or less reconstructed, and in their new form present even greater value than heretofore. In the first place, the stroke of the motor has been increased slightly though otherwise it remains unchanged, and is in its original block form; the cylinders of E-M-F cars are cast separately, as they always have been. The rear axle of the Flanders cars also has been altered to permit of a slightly larger change gear housing which has been increased in size to accommodate a three-speed selectively operated transmission in place of the two-speed gear which originally was used. The brakes have been redesigned and now are internal expanding and external contracting operating on the same drums, instead of the double internal expanding members, which have been used in the past. The steering gear has been revised to permit of greater accessibility and also to make adjustment and easier action possible. There really are

found necessary to put up a stout railing around it. That much wonder is expressed regarding the method by which the chassis was so perfectly "sliced" is nat-



FLANDERS LEVERS AND HORN

ural, and though it has been suggested that the division was made with the aid of a "tremendous buzz saw," the operation was infinitely more complicated. Those who are of an investigating turn of mind will have little difficulty in locating the man who claims he was responsible for the innovation, for he is in attendance, and his

upholstering that is ten inches deep. Add six-cylinder motors, long wheelbases and big tires, and the picture of a high-class, luxurious car is complete.

This does not mean, however, that the Palmer-Singer cars are sold at top-notch prices. As a matter of fact, they compare favorably in appearance, and in specifications, with cars of double their cost. The "sixes," of 60 and 40 horsepower, cost \$3,000 and \$2,000 respectively, and attract no little comment because of their imposing appearance, as compared with the price list. Mechanically, the two "sixes" have a strong family resemblance, both having the same general lines, with shaft drive, selective sliding gears and full floating rear axles running on imported ball bearings. The "Brighton six," as the smaller car is called, has three speeds, however, while the "big six" has four, and the wheelbases are 127 inches and 138 inches, respectively. In the larger car the cylinders are cast in pairs and in the "Brighton" in threes.

The triple-jet carburetter developed in connection with the Palmer-Singer six-cylinder motor is not only automatic as to the

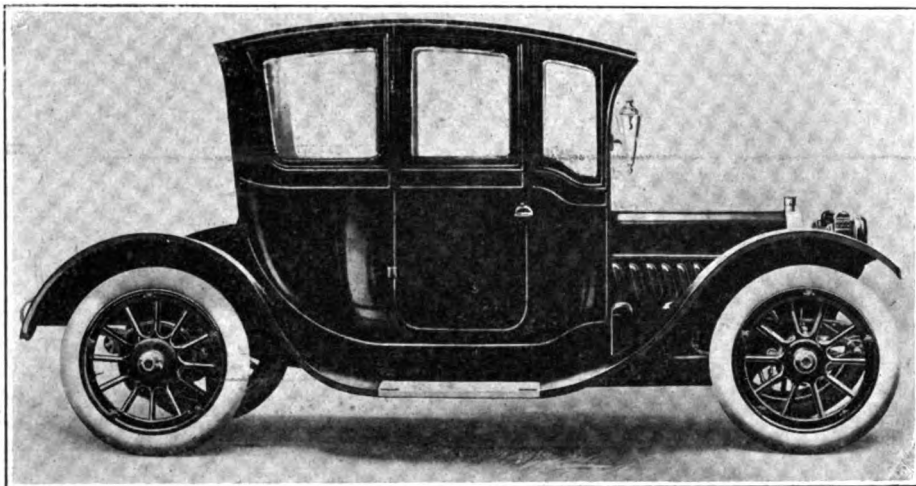
supply of gasolene fed to the cylinders at varying speeds, but it is claimed that it requires little or no "tinkering" to keep it in adjustment.

There are no air adjustments and no springs; the only adjustment is that of the low-speed gasolene nozzle, which can be varied slightly to suit atmospheric conditions; but there is a stop on the adjusting screw which prevents and makes it impos-

cylinder like that of an air-cooled gasolene engine—in fact, it has much the appearance of a model engine of that type. It is gear-driven, there being a spur gear on the shaft for the purpose and a gear on the shaft of the pump which meshes with it; the latter can be slid in and out of mesh by means of a lever operated by a button placed in the floor just in front of the driver's seat.

large number of cross frames used, and the numerous and most substantial gusset plates and corner braces. The Matheson company always has believed that a frame ought to be made rigid and substantial, and they "go after" the matter with characteristic vigor.

Oakland Cars—Power Range, 30—45; Price Range, \$1,200—\$3,000.



OLDSMOBILE COUPE ON NEW "DEFENDER" CHASSIS

sible to throw the adjustment very badly out. The carburetter is so adjusted at the factory that the motor will work regardless of the position of the adjusting lever, but it will of course do its best running when the adjustment is correct.

The Palmer-Singer company has not abandoned the manufacture of four-cylinder cars by any means; the popularity of the "six," however, and the success of its cars of this type has caused it to put them forward as leaders, and the steady old "fours" naturally are somewhat cast into the shadow.

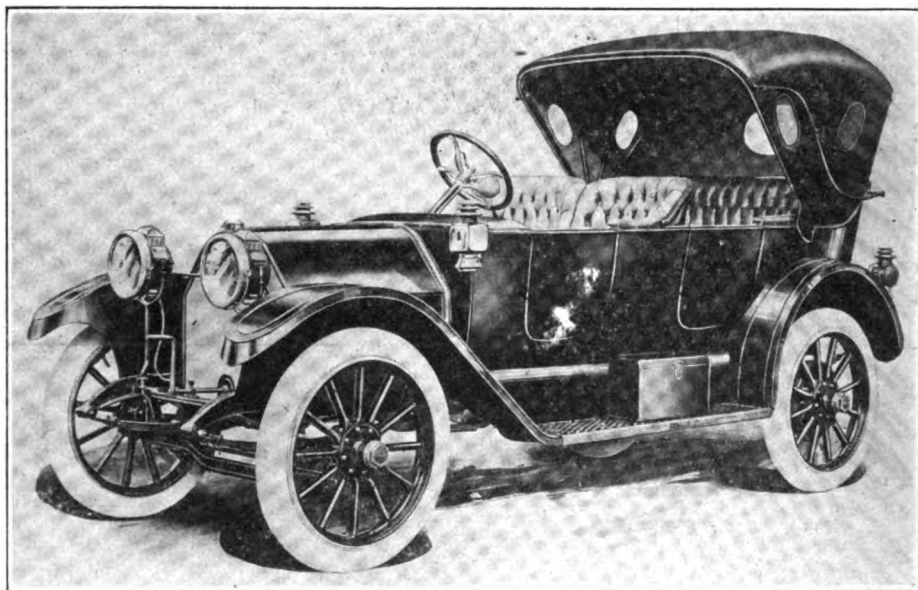
Matheson Cars—All of 50 Horsepower; Price Range, \$3,500—4,700.

The Matheson company has the distinction of being one of the very earliest not only to appreciate the importance of silent running in a motor car, but to make serious and productive efforts to build silent running machines. The culminating result, the Matheson "silent six," for some time has been known as just what its name implies—a silent car. In bringing out the current models the Matheson company has made a few mechanical and body changes, though none are of radical character excepting, perhaps, the removal of the gear-box from its former location on the rear axle to the more conventional forward location. The general trend of the trade is followed in placing the control levers in the center of the car instead of at the side, and they are enclosed in an aluminum housing. A very neat and practical addition to the equipment of the car already unusually complete, is an air pump for inflating tires. This is made with a single

Springs have been somewhat changed to give easier riding, those in the rear being three-quarter elliptics instead of full ellip-

After a fashion the Oakland "sociable" roadster is about the most radical car in the show. There is no other single-seat car designed to carry three passengers. The car is of smart appearance and is of the popular closed-body type with skuttle dash and a turtle-back effect to the body back of the seat, the space under the rounded part being occupied by a gasolene tank of 37 gallons capacity and a large storage space reached by a hatch. The real novelty of the car, its wide seat, is not apparent at first glance, but the seat, nevertheless, is 46 inches wide, and will seat three fairly large persons comfortably, the driver on the right. The "sociable" has a four-cylinder 40-horsepower motor and a wheelbase of 112 inches, its chassis being the regular model 40, which also mounts a coupe and a five-passenger touring car.

Recognizing the deserved popularity of the Berline type of body, the Oakland company has brought out one on a 45-horsepower chassis with a wheelbase of 120



FLUSH-SIDED FIVE-PASSENGER OAKLAND

tics, and slightly longer. Running boards are an inch wider, are placed lower than before, and are cleared of all boxes, and the appearance of the dash has been improved by the removal of everything except the coil box, gas and oil gauges and compression relief handle.

A distinctive feature of the Matheson chassis, and one that is particularly impressive because of the oft-repeated statement that it is impossible to make a motor car frame that will not "weave," is the

body and excellent finish, its really fine upholstery and its equipment of electric lights and silk curtains to add to the comfort of the passengers, is a highly creditable production, and a machine of which no one owning it need be ashamed. The smallest member of the Oakland family, the little "Oriole" roadster, is a 30-horsepower car with 100 inches wheelbase, having a body of the so-called "torpedo" design with a big cylindrical gasolene tank behind the seat. The same chassis, with its

wheelbase increased by twelve inches, carries a five-passenger closed-front touring body, designated model 30. Practically no changes have been made in the Oakland cars so far as the chassis are concerned.

Premier Cars—Power Range, 40—60; Price Range, \$3,000—\$5,500.

An example of enterprise and of putting experience to profit is furnished by the

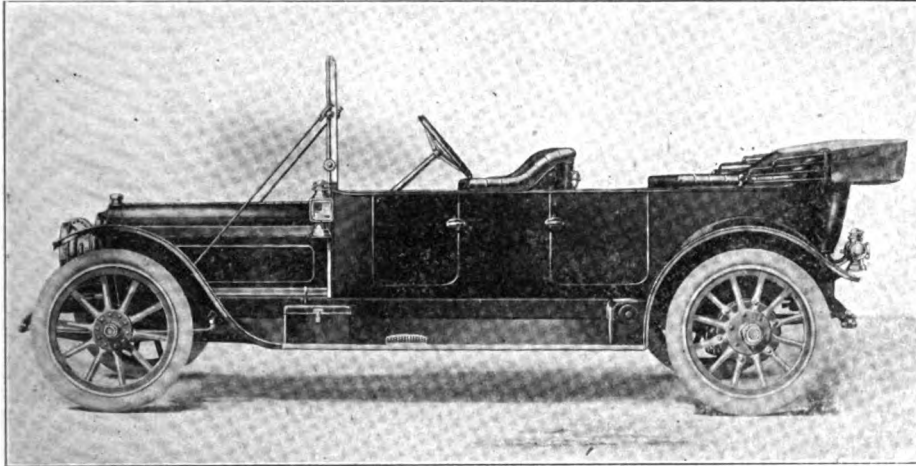
facturers, the Premier company has made few changes in the two chassis upon which all its cars are built. The clutch release has been improved by mounting it on annular bearings working against hardened and ground steel disks, to give perfectly free movement; the brake equalizers, for both emergency and service brakes, are anchored to the rear of the steel sub-frame that carries the gearcase; and the take-up

pany's chief source of pride is the fact that all the cars entered in these contests have been stock machines, pure and simple.

The standard National "forty" remains practically unchanged. Something new is shown, however, in a chassis carrying a motor of the long stroke type, the stroke being 6 inches and the bore $4\frac{7}{8}$ inches. The motor is the only really new feature of the new model, all other details being similar to the older car except the wheelbase, which is 129 inches, while the standard "forty" has a wheelbase of 124 inches. The same body types are fitted to both chassis, and these are unchanged in all material details, though they are swung a little lower, and the running-boards are brought a little closer to the ground. The upholstery is extremely luxurious, being ten inches deep and very soft and comfortable. All Nationals are equipped with self-starters and, following the trend of the trade, the wheels are fitted with demountable rims. Electric lights top off an equipment list that is unusually complete.

Mercer Cars—Power Range, 30—32; Price Range, \$2,500—\$3,800.

In front of a picturesque background of shining silver trophies, of which the Savannah cup looms largest, Mercer cars present considerable latitude for choice inasmuch as they are shown in several different body styles on the two chassis



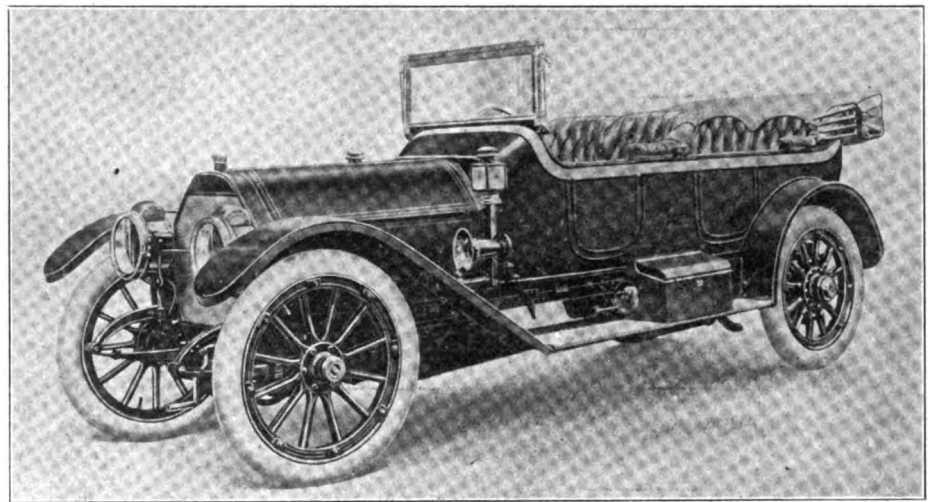
THE NEW GARFORD "SIX-FIFTY"

Premier company in entering what is, in a way, a new field and bringing out as a stock model a car that heretofore has been built only on special order—a touring car that to all appearances is of the usual open type, but can be converted in a few minutes into a completely enclosed limousine with glass windows in front and at the sides. This car, known as the "touring de luxe Premier," is intended as an all-weather touring car, in which extended "cruises" can be made with far more comfort than the open touring car can provide, even with the addition of a top and side curtains. The windows at the sides, the glass partition at the back of the driver's seat and the wood supports at the corners and the sides of the windows, drop into rubber-lined pockets when not in use, and the top folds back in the usual way. The "traveling home" idea is carried still further by arranging the rear seat so that it can be pulled out and, with the aid of extra cushions, made into a bed that is not to be despised as an alternative to sleeping "sitting up." The new car is finished in a restful green color, both inside and out, and may be had with a 40-horsepower four-cylinder motor, or a 60-horsepower "six."

Another new Premier is a big, handsome Berline on the 60-horsepower "six" chassis, a car with plain, simple outlines that give it a certain dignity and impressiveness, and having an extremely long wheelbase—140 inches—that should make it a car decidedly comfortable to ride in. The Premier Berline has all the usual luxuries of a car of its type, and its finish leaves nothing to be desired.

Like the majority of "old line" manu-

on the brakes can be reached by lifting the floor boards of the front seat. This makes it so easy to keep the brakes in proper adjustment that there is no real excuse for



ALCO SIX-CYLINDER TOURING CAR

trouble of this character on 1912 Premier cars.

National Cars—All of 40 Horsepower; Price Range, \$2,500—\$3,000.

The name of the National company stands high on the list of concerns that believe in the utility of racing as a means of finding out the weak spots in motor car construction, and the success of National cars in racing events, on track and road, is clearly indicated by the resplendent pyramid of trophies piled up at the front of the National exhibit at the Garden. The com-

which comprise the line. In view of the record made by Mercer cars in road and track events during the past year, it is perhaps natural that chief interest should center around the roadster types, two of which are shown. One of them, finished in bright yellow, which color has been perpetuated by the manufacturers, is practically a racing car, or rather it may be converted to one by the simple expedient of removing the mudguards, which are constructed with this end in view. The other is a compartment roadster finished in blue and having an enclosed body. The gasoline tank is

slung under the rear axle, leaving an unusually commodious compartment at the rear for the storing of tools and spare parts; spare tires are carried in a rack at the back in true racing car style.

Mechanically, the cars have come in for considerable revision. A completely new four speed change gear mechanism has replaced the three speed transmission used heretofore. In the new gear box, third speed ahead is direct drive and fourth speed is an overstep. The multiple disk clutch now is enclosed in the change gear housing instead of in the flywheel and the service brake has been moved from the rear wheels to a position on the propeller shaft just aft the transmission. The motor remains the same except that in the roadster models the bore has been increased from $4\frac{3}{8}$ inches to $4\frac{1}{2}$ inches, the stroke remaining unaltered; it is 5 inches. Other refinements include the adoption of Bosch two-spark ignition and a change in the steering mechanism embraced in the use of a full worm wheel instead of a sector.

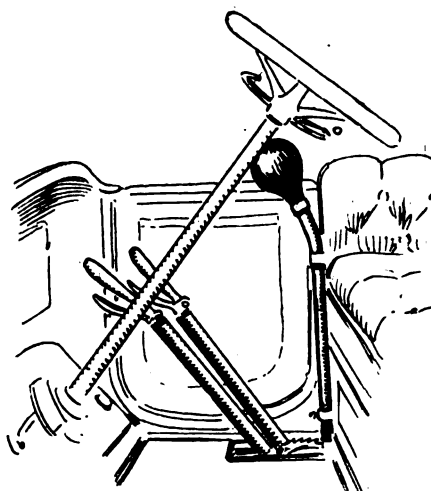
Overland Cars—Power Range, 25—45; Price Range, \$850—\$2,000.

The Overland family—a line of no less than nine different models mounted on four chassis—is, if anything, smarter looking than ever, the adoption of closed-front bodies and center control as standard being factors in effecting this result. The improving hand has not been spared in other directions. Model 61, which has a motor of 45 horsepower, has been improved by the substitution of a full floating rear axle for the semi-floating type used last year. Timken roller bearings are used in the axles, both front and rear, and throughout the gearbox F. & S. ball bearings are used. An improvement that extends throughout the Overland line consists in making all wheels heavier than formerly and further strengthening them by the use of wider hub flanges and double the former number of bolts, one for each spoke instead of one for every alternate spoke. The 40-horsepower motor of last year has had its bore increased by $\frac{1}{8}$ inch, with the result that the power is increased to 45, though there are no other engine changes, apart from the enclosing of all valve stems and springs in cylindrical cases with the object of reducing the noise of the engine when running and excluding dust. In all models except the little runabout, model 58 R—which employs planetary gear—the speed change gear is of the three-speed sliding selective type, and the control levers are placed in the center of the car, instead of at the side. In former sliding gear models the gear shifting lever had a lateral movement as well as a fore-and-aft motion, and this, in a center-control model is somewhat inconvenient. Therefore the mechanism has been changed so as to eliminate the lateral movement, and instead the lever has an up and down play as the complement of the fore-and-aft motion. The vertical motion

has exactly the same effect as the sideways swing of the ordinary type of selective gear lever. In order to make the handling of a lever of this kind easy, the handle on the top consists of a large ball of hard black rubber, and on the top are engraved directions for operating the lever.

Maxwell Cars—Power Range, 16—36; Price Range, \$600—\$1,480.

Thoroughly renovated and polished until it reflects the myriad lights in the Garden in thousands of points, the much-coveted Glidden trophy stands sentinel at the Maxwell exhibit and furnishes "quite some" attraction, for a duplicate of one of the three Maxwell "Specials" that won it after a hard-fought battle of some 1,400 miles is on view and quite naturally occupies the most of the limelight. Mechanically, the Maxwell line has changed but slightly since last it



MAXWELL CONTROL ELEMENTS

was displayed for public approval, though externally it has been altered and improved materially in appearance by the adoption of a new style of radiator, minus the well-known broad bass band, and a new engine bonnet. Despite these changes, however, the thermo-siphon system of cooling which is a time-honored characteristic of the Maxwell line is retained. Names now designate the four models listed instead of the more or less confusing letters and numbers which heretofore have been used. Models GA, EA, I and AB, have become the "Special," which is a new model, the "Mercury," the "Mascotte" and the "Messenger," respectively, the names suggesting not a little the general characteristics of the several cars to which they apply. The "Special" is a roomy, five-passenger closed front touring car mounted on a 36-horsepower chassis and lists at \$1,480. The motor is of the long-stroke variety, the cylinders measuring $4\frac{1}{2} \times 5\frac{1}{2}$. One of its newest features—one which has only just been added, as a matter of fact—is a motor-starting device of the acetylene type; it is included as standard equipment without extra cost. In the "Mercury" is revealed a snappy-looking enclosed body roadster

which features a 30-horsepower motor and other general details in common with the larger car. The "Mascotte" is styled a family touring car and as such mounts a five-passenger body. It also is supplied in roadster form, however, the body being exceptionally roomy and comfortable; it is fitted with a deep skuttle and high doors enhance its general appearance considerably. The chassis on which both bodies are fitted is rated at 25-horsepower, though on actual test it develops considerably in excess of this figure. Aptly styled the "Messenger," the smallest car in the line features a two-cylinder opposed 16-horsepower motor, and is equipped with either open or closed bodies which accommodate two passengers. With the exception of this model in which a two-speed planetary change gear mechanism is used, all the cars are equipped with three speed selectively operated transmissions and in all of them the clutch is of the multiple disk type, a feature which has been common to Maxwell cars for a number of years.

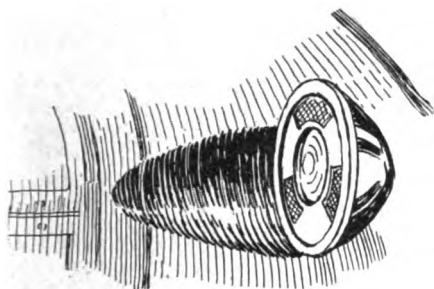
Cadillac Cars—All of 30 Horsepower; Price Range, \$1,800—\$3,250.

Though the Cadillac car is rated at 30-horsepower and has been known for a number of years specifically as the "Cadillac 30," engine modifications including carburettor improvement and an enlargement of the valves, together with sundry other refinements of detail, permit the motor actually to develop in excess of 40-horsepower. The old designation, therefore, is somewhat incongruous. Coupled with these engine changes, none of which are radical in nature, larger wheels and tires, larger brake drums and the adoption of metal bodies in place of the wood bodies heretofore used place this well-known car on an even higher plane of excellence than ever before. Except for these changes, there is nothing new in the line, its continuance in past form bearing mute testimony to the correctness of previous design and construction. The statement that there is nothing new about the line, however, requires a slight modification inasmuch as the engine starting and lighting system which has been added is most decidedly new. The system is the product of the Dayton Electrical Laboratories Co., and the Cadillac bears the distinction of being the first car to be regularly equipped with it. As the name of its manufacturers suggests, it is an electrical device, the essential features being a motor-generator, an automatic cut-out, a registering meter and a storage battery. The motor-generator is attached at one side of the engine and is driven by it when the engine is running under its own power through the timing gear train. When the generator is used as a motor to start the engine it drives the engine through the intermediary of a gear which meshes with another gear on the periphery of the flywheel. When the engine is to be started it is merely necessary for the driver to place

the spark control lever in the retard position and depress the clutch pedal all the way when the generator automatically is connected to the engine and the current from the storage battery is turned on. Immediately the engine starts the flywheel gears are taken out of mesh automatically and the generator is driven from the timing gear train. The storage battery thus is kept constantly charged and serves both to light the side, tail and head lamps, and to furnish current for ignition.

American Cars—Power Range, 22–50; Price Range, \$1,250–\$4,250.

The American line, which is characterized as being the original exponent of underslung construction, has been increased in size by the addition of two new models, both of which follow closely the general features of the older car in their incorporation of underslung frames. The older and most impressive model, which is styled the American Roadster and mounts a 50-horse-



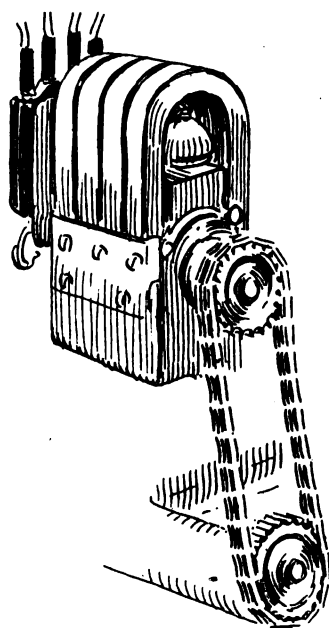
AMERICAN VENTILATOR-LAMP

power motor is continued unchanged except for a few refinements here and there, such, for instance, as the raising of the tonneau floor and seats slightly, so as to conceal the torsion tube and the adoption of a new fastening which permits the radiator to be removed more easily. Though only four-passenger bodies heretofore have been supplied, the manufacturers, in fact, specializing on this particular type of body, the line as revised includes a six-passenger body on a chassis with 140 inches wheelbase. One of these cars, tastefully finished in gray, relieved by nickel trimmings, never fails to attract the attention that has come to be expected as the just due of this unusual line. One of its more noticeable features are the lamps which are circular and are let into the deep skuttle; they serve a double purpose, the lamp proper being in the center, electrically equipped, with a circular ventilator made integral surrounding it. Of the two new models, the American "Tourist" mounts a 32-horsepower motor, the cylinders of which measure $4\frac{1}{2} \times 5$ inches; they are of the T-head type and are cast in pairs. The other new model which is styled the "Scout" is equipped with an L-head block motor rated at 22-horsepower, the cylinder dimensions being $3\frac{3}{4} \times 4\frac{1}{2}$ inches bore and stroke. Both chassis employ three speed selectively operated change gear mechanisms. The wheelbase

of the former is 118 inches and of the latter 102 inches.

Elmore Cars—Power Range, 30–50; Price Range, \$1,150–\$1,750.

The Elmore company has the distinction of being one of the few concerns that have made a consistent success of the two-cycle car, and has developed its motor and improved it from year to year, until it gives results that have reached a high state of development. The last important change made was the adoption of the two-diameter piston and the rotary gas distributor, eliminating crankcase pressure and its attendant troubles; since then changes have been of the slightest. In the current models the rotary distributor has been increased in diameter and the ports have



ELMORE "SILENT" MAGNETO DRIVE

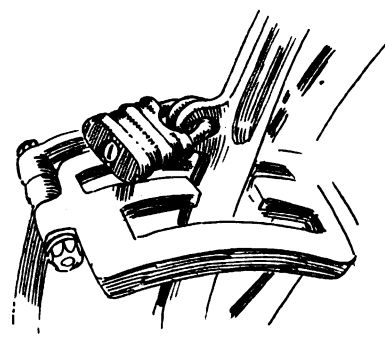
been made larger and of different shape, all with the idea of permitting a freer flow of gas, and the gear drive of former models has been replaced by the popular silent chain method, the chain running in oil. The same type of drive is employed for the magneto which, for convenience of access, has been raised until its top is almost level with the tops of the cylinders, being bolted to a bracket rising from the crankcase. Formerly the magneto was bolted direct to a platform on the crankcase. A more symmetrical appearance and a little better distribution of the cooling water is secured by carrying the water manifold directly over the center of the cylinder heads; formerly it was a little to one side. While previous Elmore engines have been equipped with a carburetter manufactured especially for them at the Elmore factory, this year the Schebler model L has replaced it.

Aside from the engine changes referred to the only departures from 1911 design are the abandonment of the multiple disk

clutch for one of the expanding ring type, and the placing of all control levers inside the closed-front body. No additions have been made to the list of models, which includes five touring cars and a roadster of the skuttle dash type.

Hudson Cars—All of 32 Horsepower; Price Range, \$1,250–\$2,750.

The refinement of the Hudson product, which is full of appealing features has been refinement in the real sense of the word, and as distinguished from marked alteration. The intake manifold is now bare and the carburetter is water-jacketed, the reverse of former practice. The muffler has been enlarged; the radiator is fastened to the longitudinals by means of bolts, allowing of movement, and leather washers are fitted between the radiator leg and frame member for this purpose. A steel plate reinforces the radiator and gives the cellu-



HUDSON LEVER LOCK

lar appearance, although the vertical gilled tube type is still retained. In the clutch, all-steel disks are used, with cork inserts on alternate disks and small springs with an aggregate power of ten pounds are fitted between the plates to ensure disengagement when the clutch is drawn. The half axles have been increased in size to 1.5-8 inches, and among the changes in the differential construction are a longer ring on the driving bevel, a new spider with oblong slots and rectangular ended pinion spindles permitting of slight movement on starting, etc. The spring shackles are all bronze bushed and the springs are of vanadium steel. The brake lever is fitted to the inside of the quadrant to accommodate the torpedo body. The front hubs are equipped with Bower roller bearings in place of the plain bearings of 1911 models. All motor tappets are removable without lifting the cylinder and the connection between the pump and motor circulation inlet is by hose clamps, permitting ready removal. A Disco self-starter is employed.

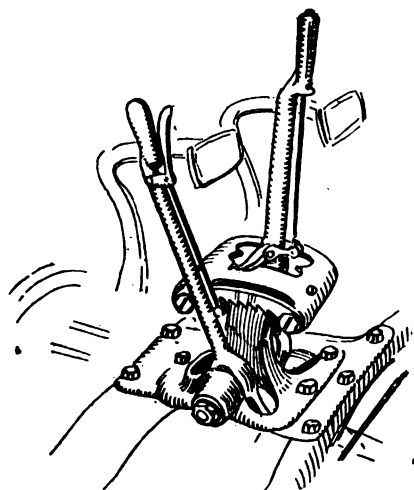
Corbin Cars—Power Range, 30–40; Price Range, \$2,000–\$4,000.

Though there is a very marked tendency on the part of nearly all the motor car makers exhibiting at the Garden to stick to those constructional forms and body designs that have been tried and found satis-

tory in the past, there are few who have not made at least some slight change, either in chassis or body. The Corbin company, however, is one of the very few who "stood pat." Its 30-horsepower chassis, with motor and gearcase made a unit by a sub-base common to both, and the 40-horsepower chassis with its long stroke motor, both are left exactly as they were in 1911. "They were so good in 1911 that we cannot see where we can improve them," was the way the situation was summed up at the Corbin stand at the Garden.

Mitchell Cars—Power Range, 30—60; Price Range, \$950—\$2,250.

The air of mystery that surrounded the Mitchell exhibit blew away when the Garden opened for the show, and two new Mitchell cars were displayed—a "baby six" and a two-passenger roadster, of 48 and 30-horsepower respectively. The new "six" has its cylinders cast in pairs, and is of the offset type. An entirely new system of



MITCHELL CENTER CONTROL

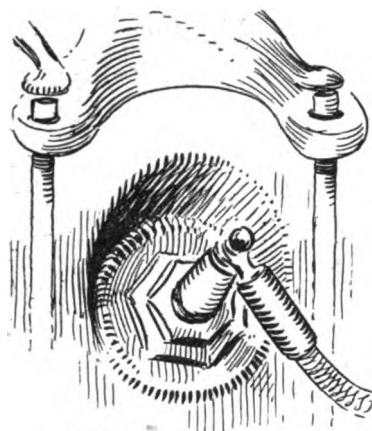
lubrication for the engine has been worked out, consisting of a sort of compromise between the wholly self-contained system and the exterior oiler arrangement. In the lower left-hand corner of the crankcase is the oil pump of the plunger type, operated by a special cam on the camshaft, which is directly over the pump. This keeps the oil circulating in the same way as in the self-contained system, but there are special exterior oil feeds to the main bearings, while the connecting rods and cylinders are taken care of by splash from the crankcase. One of the neat features of this system is that the pump can be taken out by the removal of a single cap nut which holds it in place in the crankcase. This oiling system is common to all the Mitchell models—the big and the little "sixes" and the two "fours," 30 and 35 horsepower. Another change made for this season that is embodied in all the Mitchell chassis is the placing of the control levers in a central position, mounted on a bracket which rises from the cross frames that carry the gearbox. Rear axles in all models are of

the full floating type, even to the \$950 "Two-four," and all have three-speed selective speed change gears.

All Mitchell bodies are of the closed-front style, and all have a very smooth exterior appearance because of the absence of outside handles and hinges. Owing to the placing of the control levers in the center there is nothing to prevent the use of a door on the right hand side, and accordingly, a door is placed there, as well as on the left. Breaking away from the polished brass that has been the standard finish almost from the proverbial "time immemorial" all lamps and polished fittings are given a black finish with only a touch of brass to give an effective contrast.

Buick Cars—Power Range, 22—32; Price Range, \$850—\$1,800.

Buick cars have seen many changes since the days when they had two-cylinder opposed motors, and the eye that can detect any resemblance between the early models and those of the present day must be keen



BUICK DIAGONAL PLUG

indeed. Apparently, however, the day of changes has nearly passed, for the Buicks now on exhibition at the Garden are but slightly changed from those staged at the previous show. The most notable change is the housing and arrangement of the brake and speed-changing levers within the right front door itself. It is one of the few real innovations of the season. Another change of note is contained in the substitution of a leather faced cone clutch in all models, for the multiple disk clutch previously used, and the employment of three-speed sliding gears in the two models that last season had planetary gears. All Buicks have overhead valve gear on their four-cylinder motors, and the current models have had their valve gears improved in the matter of quiet operation, and grease cups for the lubrication of the rocker arm have been provided. The two models that heretofore have had 30-inch wheels, have been fitted with 32-inch.

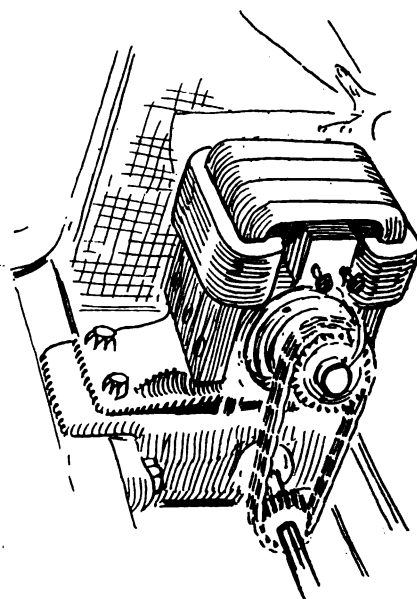
Marquette Cars—Power Range, 40—45; Price Range, \$3,000—\$4,000.

New, in the sense that never before have they appeared at a show, Marquette cars

are an avowed blending of the old Welch-Detroit and Rainier cars, and as such incorporate the best features of both of these once famous brands. In addition, a number of new and distinctive features have been added.

The smaller of the two styles of chassis is rated at 40 horsepower, with a motor the cylinders of which measure 5 x 5, and is largely a continuation of the former Welch-Detroit model which immediately preceded it.

The wheelbase of the chassis is 122 inches and its essential features are a three-speed selectively operated change gear mechanism, an improved cone clutch, full floating rear axles and semi-elliptic springs both front and rear. Tire sizes have been increased to 36 x 4½, both front and rear, and the equipment has been made more complete by the addition of demountable



MARQUETTE GENERATOR MOUNTING

rims and combination electric and oil lights. As either a five-passenger touring car with enclosed body, or roadster, it lists at \$3,000. The larger chassis, rated at 50 horsepower and mounting a T-head motor with 5 x 5½ inch cylinders, follows more closely the lines of its Rainier ancestor, though it has been changed considerably. A new radiator of a different shape, a Zenith carburetor, a cone clutch and Splitdorf double ignition in place of the make and break system for which Rainier cars were famous, constitute the principal changes which have been made. Demountable rims have been added as an item of stock equipment, as has a lighting generator. The generator is located on a bracket at the side of the engine and is driven from the pump shaft through the intermediary of a chain of the "silent" type. The motor and gear set are separate instead of being combined in a unit, and each is supported at four instead of three points. Other features, such as the four-speed gear box and full-floating rear axles, are retained. The equipment with both chassis is unusually complete and

includes top, windshield, demountable rims and top boot.

Haynes Cars—Power Range, 30—60 Horsepower; Price Range, \$1,650—\$3,800.

Quite extensive changes have been made in model 21 Haynes chassis, including a new motor of increased power. The general tendency toward long stroke motors has been followed in increasing the stroke from 5 to 5½ inches; the bore is now 4½ inches, a quarter of an inch greater than last year's model 21. An Eisemann magneto is now used. In general design the motor and other parts of the chassis retain the Haynes features of the past, including the contracting band clutch and the suspension of the motor on special springs. Bodies in all models have been made somewhat roomier and a number of new bodies have been added; these include a limousine and coupe, both on the new 40-horsepower chassis; model 21, a speedster, which has the lines and rakishness of a racing car, on the 30-horsepower chassis; and a larger limousine on a 60-horsepower chassis.

The Colonial coupe is a particularly handsome and luxurious little vehicle, having delightfully soft upholstering of gray cloth and a full equipment of electric lights. The body is set quite low, and the wide oval window at the rear, with the usual front and side windows, affords a clear view in all directions, the unglazed areas being small.

All Haynes models are sold with full equipment, which includes top, windshield, Warner 60-mile autometer, Prest-O-Lite tank and the usual tools. The top is designed to lie horizontal when folded, giving a particularly neat appearance.

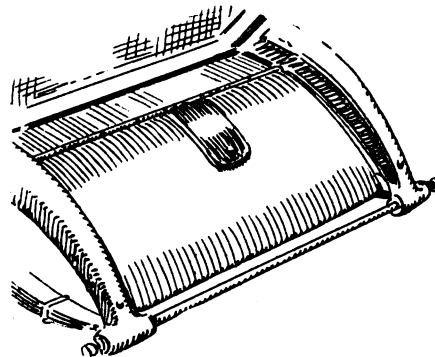
Cartercars—All of 30-horsepower; Price Range, \$1,200—\$2,100.

Bearing the distinction of being the only exponent of the friction driving principle at the show, the Cartercar possesses a number of unusual features that make it of more than passing interest. The principle is old, of course, for it has been used in Cartercars and others for a long term of years, though it is none the less interesting by reason of the fact that the friction transmission furnishes the ideal of an infinite number of speed changes with the minimum of complicity. The driving plate of the Cartercars has been made considerably more efficient by the adoption of a bronze facing in which considerable ingenuity is evident. The facing is in two concentric pieces, and is of two degrees of hardness, the softer piece being near the center of the plate to increase the adherence between the driving and driven members at the lower speed ratios. Final drive is by means of a single chain of the silent type which operates in an oil bath in a tight housing. Two side levers now are used in place of the single lever which last year was used. One of them, terminating in a ball, serves to move the driven disk across

the face of the driving plate and thus to alter the speed ratio, and the other operates the emergency brakes on the rear wheels. Following the general tendency, a self-starter has been added to the motor as regular equipment, and the efficiency of the motor itself has been increased by several minor improvements, the most evident of which is embraced in the enclosing of the valve stems and springs by means of light, removable metallic covers.

Inter-State Cars—Power Range, 40—50; Price Range, \$1,700—\$3,400.

Extensive changes have been made throughout the Inter-State cars, and they are practically new machines from spring-horns to starting-crank—or rather, to the place where the starting crank used to be, for the Interstate is now a crankless car, being equipped with the Aplco electric starting and lighting system, which was shown in actual operation on the polished chassis forming the mechanical center of the exhibit. The Aplco system is operated from



INTER-STATE SPLASH GUARD

a miniature controller box at the front of the driver's seat, and there are located all the switches. So assured are the makers of the car of the reliability of the device that they have removed the crank, and the space between the front ends of the side frames is filled in with a sheet metal mud-guard. To meet emergencies, however, this pan is hinged so that it can be dropped, leaving the end of the crankshaft projecting to receive the crank. Constructional changes are many. The motor, formerly built with paired cylinders, is now cast "en bloc." This applies equally to both 40 and 50-horsepower chassis, which are alike in all essential features excepting dimensions. The gearbox and clutch, formerly a unit, now are separated and the gearbox is mounted on a four-point suspension. Drive is through propeller shaft with two universal joints, instead of through a shaft enclosed in a torque tube. The oil pump for the self contained lubricating system is submerged in the oil well at the bottom of the crankcase.

One of the items of the regular equipment of the Inter-State is a tire pump of novel construction. It consists of a long cylinder with heat-radiating flanges which fits into a socket on the top of the rear cyl-

inder head. A long rod, which might be called a piston rod, is attached to the plunger and passes down through the motor cylinder head until it comes in contact with the top of the piston. The rising of the piston when the engine is running, forces the pump plunger up, compressing the air, and it is returned, following the motor piston, by a spring. A long tube carries air to the tires. The pump is attached by means of a sort of bayonet joint and the opening into the cylinder is closed when not in use, by a valve.

Like several other makers, the Inter-State company has abandoned polished brass for the finish of lamps and other fittings, and the standard finish is nickel and black enamel. All cars are sold with full equipment, including the Aplco self-starter and electric lighting system, top, speedometer, clock, power tire pump and the usual kit of tools.

Simplex Cars—Power Range, 38—50 Horsepower; Price Range, \$4,000—\$6,500.

Since the automobile show of last season, when the Simplex company brought out for the first time a shaft-driven model in addition to its chain driven cars, no changes have been made in design or construction that are in any way radical. The shaft driven car, which mounts a long stroke motor of 38 horsepower, and the chain-driven machines, are practically alike except as to their size and final drive, and in mounting various bodies wheelbases are varied to suit the service. A multiple jet carburettor is employed in the shaft car, and the single jet carburettor that formerly was common to both types, is used in the chain driven cars only. A change in the ignition system is the substitution of the Bosch dual system for Bosch high tension magneto, this being necessitated by the addition to the equipment of all models of acetylene starters for the motors.

Ohio Cars—All of 40-horsepower; Price Range, \$2,150—\$3,350.

On all models, slight changes have been made in the motor, in thickening the top of the crankcase and web-sections, and forming of oil-troughs to and oil pockets above the main bearings. The third point of the unit power plant at the front is now above instead of below and the mud apron is raised correspondingly. The fan pulley is fitted with an eccentric belt tightener and an additional packing nut has been put on the front end of the pump. The clutch has six bronze plates and a ball bearing is fitted to take the thrust at the change gear casing. The packing device between the clutch and change gear compartments of the unit power plant is a screw packing nut, and parts of the universal joint housings are lather instead of all metal as before. The fenders have no flanges, and the skirts are increased in width. Demountable rims are fitted to all models. An improved hood lock is used, and a flange is

formed on the radiator for supporting the hood. The wheelbase on the Model R has been increased to 118 inches, and on the Clifton model and the Bullet roadster Bosch dual ignition, 36 x 4-inch tires and combustion electric and oil side and tail lights have been installed.

Pullman Cars—Power Range, 30—60; Price Range, \$1,600—\$2,750.

Two entirely new models mark the Pullman display. The new comers are a big six-cylinder machine of 60-horsepower and a "four" of 40-horsepower. Generally speaking, both bear the earmarks of the Pullman family, and both are much alike, apart from the fact that one has two more cylinders than the other. The cylinders are alike in both engines, and are cast in pairs, in which they differ from the older models, which have individually cast cylinders. Both new cars have four-speed selective sliding change speed gears of particularly compact design; gears and shafts

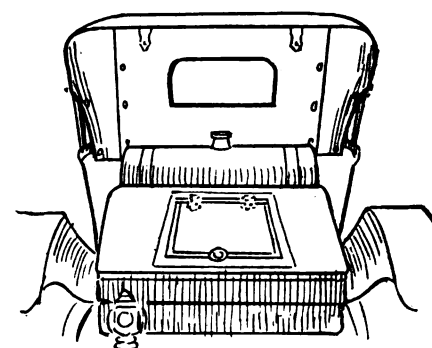
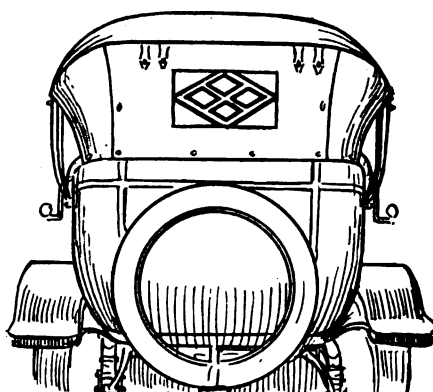
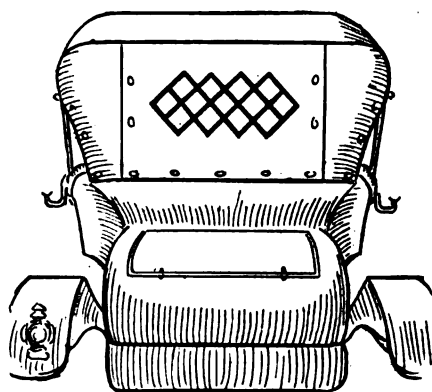
roadster is of the accepted two-passenger type, and its long stroke engine, with bore and stroke of four and six inches respectively, gives it ample power for all kinds of road work. The equipment that accompanies the machine as its standard outfit is somewhat unusually complete. There is of course the usual set of tools and lamps, and a Prest-O-Lite tank; but in addition there is a self-starter, windshield, top and an extra tire in a tire cover strapped on behind the big oval gasoline tank in the rear of the seat. This is rightly considered a liberal outfit for a 35-horsepower car selling for \$1,700.

Changes made in the "mechanical department" in bringing the chassis up to 1912 requirements include only such minor matters as enclosing the valve mechanism to secure silent running; the adoption of the Schebler carburetter, arranged for adjustment from the dashboard, and an increase of wheelbase from 112 to 116 inches. Honeycomb radiator is used, instead of

passenger touring body. The Amplex on exhibition is the imposing four-cylinder two-cycle 50-horsepower model with the compressed air starting system, which has been an Amplex feature for four years. It already had been brought to a stage where improvement, save of the most insignificant character, was not possible, and therefore remains unchanged and unchanging. It is built in roadster, touring car, phaeton and limousine forms.

Case Cars—Power Range, 30—40; Price Range, \$1,800—\$2,050.

While the Case car may be said to belong to the younger generation of automobiles, it is built by a big concern of wide experience—the J. I. Case Threshing Machine Co.—which just has become bigger and more resourceful by the addition of thirty-five millions to its capital. Also it has brought out a "Greater Case," which will be marketed in addition to the two older models. The newcomer is a 40-horsepower



REAR "WINDOW" DESIGNS OF TOURING CARS THAT RENDER THEM EASILY RECOGNIZABLE

all are made of three per cent. nickel steel. One of the little things that are inconspicuous but helpful is the placing of the handle which controls the level of the oil in the engine lubricating system on the top crankcase, where it can be reached without difficulty, instead of the usual position underneath where it is necessary to do contortions to get at it. In the matter of equipment the Pullman new models are well taken care of, for in addition to the usual tools, they are supplied with electric motor starters and lighting systems, tops and boots, windshields, speedometers and demountable rims. And in addition to this, the six-cylinder car equipment is unique in that it includes an electric vulcanizer.

Moline Cars—All of 35 Horsepower; Price Range, \$1,600—\$1,700.

Among the cars which are not pointed to as having a long-stroke motor as a new feature is the Moline; it was one of the first to adopt it more than a year ago. And the particular pride of the Moline exhibit is the new roadster, built on the standard Moline "dreadnaught" chassis with 35-horsepower motor that carries all the four models constituting the Moline line. The

tubular; larger piping carries the water for the thermo-siphon cooling system, the top water pipes being connected with the cylinder jackets by particularly generous headers; and the control levers all are placed inside the body, having been outside in previous models.

Amplex Cars—Power Range, 25—50; Price Range, \$2,500—\$5,000.

While the proverbial stork hardly can be called a mechanical bird, it certainly has been performing its customary tasks in the motor car families at the Garden show, and, not deigning to change its habits, has in some instances caused disappointment by failing to arrive on time. Such is the case in the "valveless Amplex" circles; it was anticipated that the "baby Amplex" would have arrived in time to be exhibited, but owing to unforeseen delays, its place is vacant. However, the overworked fowl has vouchsafed the information that the new car will be almost exactly like the present 50-horsepower Amplex except in point of size and price. The motor will be of 25-30-horsepower and the chassis will carry two styles of bodies, a roadster with the usual skuttle dash and closed sides, and a five-

machine with four-cylinder motor, shaft drive and three-speed selective sliding gears and a wheelbase of 120 inches. In general it is built like the Case 30- and 40-horsepower models that preceded it and which are still carried with some improvements. Some of the more important of the new features common to all Case cars are the addition to the equipment of an engine starter operated by compressed air; clearance increased to 11 inches; weight decreased; a new Remy magneto generates ignition "juice"; radiators are more efficient, and a Stromberg carburetter is standard.

Moon Cars—Power Range, 30—45; Price Range, \$1,600—\$4,000.

A brand new model graces the stand of the Moon company—a 40-horsepower car that differs from previous Moons in several important details. The most radical change is the removal of the gearbox from the rear axle housing to the more conventional position forward. The rear axle is of the full floating type that seems to be gaining ground every year, and an important feature of this axle is that the drive to the wheels is effected without the dog clutches

commonly used to make connection with the hub caps; the wheel flanges are formed integral with the driving shafts of the live axle, so that the driving stresses are taken by the bolts which hold the flanges in place on the hubs. The wheels run on roller bearings, and these are of the Hyatt high-duty type. Models 30 and 45, one larger and the other smaller than the new model 40, are but slightly changed. The wheelbase is model 30, which formerly was 114 inch, has been lengthened two inches and the bore of the motor has been increased by an eighth of an inch, the cylinder dimensions now being $4\frac{1}{2}$ inches bore and 5 inches stroke. The equipment of the new Moon includes a Disco self-starter.

Brush Cars—All of 10 Horsepower; Price Range, \$350—\$450.

Conspicuous by reason of its violet finish and nickel trimmings, as well as its position on a revolving turntable, also finished in

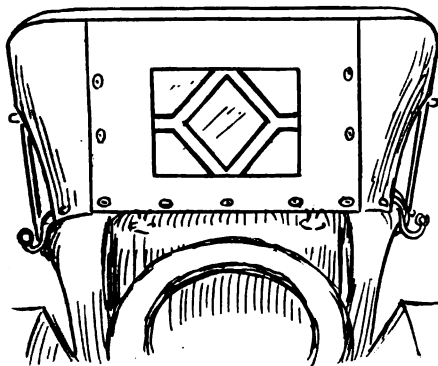
actuation. The ball-ended change gear lever has the ball and the socket joint near its lower end, and is furnished with a tongue which normally fits between the claw ends of the two-spool operating shafts. These claw ends are perforated for the introduction of latches and when the tongue is caused to enter between the claws of one shaft, the latch is pressed back and the gear on that shaft can be engaged by a forward or rearward motion of the gear lever. The other spool shaft is meantime locked from movement by its latch. The collar of the socket can be lifted and the change gear lever and tongue lifted clear, acting thus as a lock against the operation of the car. Brake and clutch control are by two pedals, the left one operating both clutch and brake, and the right one another brake only. Both sets are on the same drums attached to the rear wheels and are internal and external. Distinctive yokes are fitted to the brake rods for balancing.

the Knight engine, worm drive, change speed gearbox integral with the rear axle, control levers centrally placed and steering wheel on the left side. The engine will be of 50-horsepower, and the chassis will carry a closed front touring body for five passengers, or one for seven passengers.

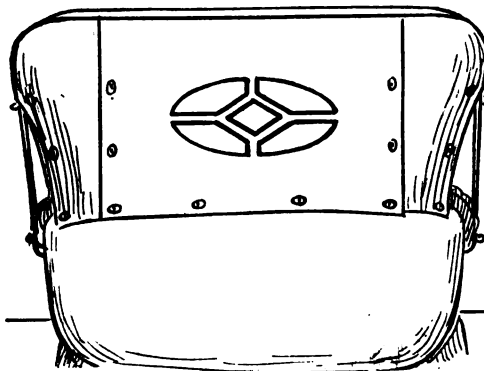
The two-cycle motor will be retained for smaller pleasure cars, for taxicabs and delivery wagons.

Courier Cars—All of 30 Horsepower; Price Range, \$1,120—\$1,150.

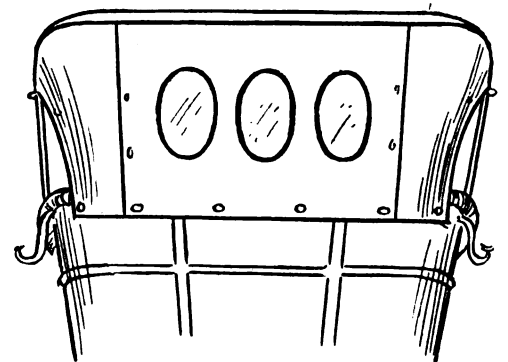
One of the unlisted exhibits at the Garden is the Courier Clermont, a 30-horsepower four-cylinder car built on what might be called conventional lines and carrying either roadster or five-passenger touring car bodies. It is staged in conjunction with the Brush runabouts. Two body types of the Courier are shown, the touring car finished in black and the roadster, a "sporty" looking car with a deep skuttle and closed body



Maxwell



Everitt



Columbia

REAR VIEWS AND "PEEP-WINDOWS" OF THREE WELL-KNOWN CARS

violet, the Liberty Brush runabout, full brother to the standard Brush runabout that has become a familiar sight, made its first appearance at the Garden, though it has been on the market for a considerable time selling for \$350. It varies but little from the design of this standard runabout, the chief difference being that the counter-balancing feature of the Brush motor is absent and the crankcase is of cast iron instead of aluminum. The mudguards are a little smaller and instead of a continuous running-board there is merely a step. The upholstery is not quite so good. No changes have been made in the standard Brush runabout which, with the exception of the Liberty Brush, is the lowest priced motor car on the American market, its price being \$450.

Reo Cars—Power Range, 30—35; Price Range, \$1,000—\$1,750.

The Reo display is dominated by "Reo the Fifth," which R. E. Olds considers his greatest achievement, and in which single lever control and left-hand steer arrest attention at once. The control is of the swinging gate change gear type with "cane handle" lever working in a ball and socket joint; there is no hand lever for brake

The half axles of the rear live axle have been increased in size slightly over those of 1911 models and are of nickel steel. Timken roller bearings are used throughout with the exception of the outer wheel bearings and countershaft, which are of Hyatt cylindrical roller type. The differential has four pinions in place of three.

Atlas Cars—Power Range, 20—50; Price Range, \$1,250—\$3,700.

Despite expectations, the new Atlas-Knight car that was to have been a feature of the Atlas exhibit failed to arrive, and therefore only the Atlas two-cycle cars are in evidence. The Atlas two-cycle motor is practically unchanged from last season, the only difference being that the fan, magneto and water pump will be driven by a chain of the "silent" type, in which is called a "triangular drive," a single chain passing around the sprockets of all three. This drive is to be standard hereafter, though the cars at the Garden were shown with gear drive to the fan as well as to the pump and magneto; the fan has a friction clutch which protects it from injury; this is to be used with the chain drive also.

The Knight-Atlas car that is to be the leader of the line will have, in addition to

in vermilion. In both the sides are of flush construction without projecting handles or hinges.

The motor is of the up-to-the-minute kind, having its four cylinders cast in a single "block" and its crankshaft running on ball bearings. The stroke is long, being $5\frac{1}{8}$ inches, the bore is $3\frac{3}{4}$ inches. Thermosiphon or gravity action circulates the cooling water; the dual ignition system consists of a magneto and an auxiliary battery. A multiple disk clutch running in oil, a three-speed sliding change speed gear selectively operated, a propeller shaft with two universal joints and full floating rear axle transmit the power of the motor to the rear wheels. Lubrication, without which the best car ever built would be useless, has been carefully worked out. The system is of the widely used self-contained order with the oil circulated by a plunging pump. On the dash there is a sight gauge so that the driver can see at a glance that his oiling system is doing its work. As is usual in lubricating systems of this type, there is an oil well below the crankcase. There are four grooves in the bottom of the crankcase, one under each crank, and these catch and hold oil, into which the connecting rods dip at each revolution; the oil circulated by

the pump flows into these grooves and the surplus flows back into the oil well. The idea is much like that of the "movable dam" system with the "movable" feature omitted. One of its advantages is that all cylinders and connecting rods get the same quantity of oil, and even on a steep hill the rear cylinder cannot get more than its share, for anything more than the groove will hold runs directly into the well. All the oil passes through a strainer each time it is circulated by the pump.

Following the lead of makers of cars costing far more money, the Brush company regularly equips the Courier Clermont with a very full outfit, consisting of quick detachable rims, acetylene self-starter for the motor, mohair top with side cur-

tains and boot, glass windshield, acetylene gas tank, gas lamps, oil lamps, and the usual outfit of tools.

Jackson Cars—Power Range, 30—50; Price Range, \$1,000—\$1,800.

Not much more room was found for changes in the Jackson line, the chief attraction being the lengthening of the wheelbases of all but the runabout model, in making the seats lower, in the addition of a yoke at the forward end of the drive shaft to support it on the frame, and in the design of the fenders. On the Model 52, the wheel base is now 124 inches, and the change-gear lever is on the inside of the quadrant to allow for the torpedo body. The price on this model is \$1,800, and the

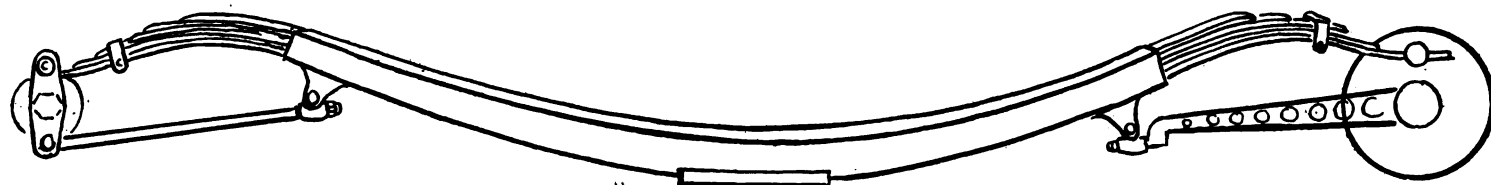
finish is all nickeled. The list is, however, minus equipment. On the Model 42, the wheelbase is 118 inches, and a similar arrangement is made for the change-gear and brake levers, but the price of \$1,500 includes the equipment. On the Model 32, the wheelbase is 110 inches, and the price is \$1,100 without equipment, while on the Model 26 runabout the same price and conditions prevail. The fenders on all models are skirted to the body and are shaped so as to throw the dust away from the car, and lips are fitted forward to prevent rising in front of the fenders from eddy currents. The other features of overhead valves, on all but Model 32, 26 and 28, which has L-head cylinders, full elliptical springs, multiple disk clutch, etc., are retained.

The Electric Cars in Evidence at the Garden Show

Flanders electrics; price range, \$1,600 to \$1,775. This car which is making its first appearance at any show, bristles with distinctiveness. The motor is of series, high efficiency type with shunt field and is mounted on the rear axle at right angles thereto and inclined upward, being supported by a seat on the axle center. The

to turn a large milled disk at his left to get the four running, two starting and two reverse speeds. The main controller is of the drum type and is driven by a small motor taking current from six of the cells, and is fitted with a device which causes it to turn the drum over point by point as the disk is turned by the operator in either

coupe models. The latter has a capacity of five passengers, all facing forward, the front seat being alongside of the driver and being of the folding type. This model has colonial lines and is of limousine construction with frameless glass lights. The wheelbase is 100 inches and the tires are 32 x 3½ inch special electric type pneumatics.

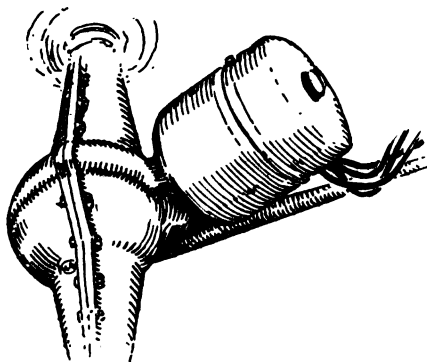


THE UNIQUE SPRING SUSPENSION OF THE FLANDERS ELECTRIC CARS

drive is by worm and worm wheel, there being a 10:1 reduction. The worm shaft, differential gear and live axle shafts all are carried on ball-bearings and the load is taken by steel nuts inside the wheels. Suspension is by reversed semi-elliptical springs whose ends attach to fittings on the axles, after the British Lanchester model, the front springs being fitted with scrolls and being pinned to the front axle fitting, while the rear spring ends fit into combined brake and radius rod hangers. Lanchester type radius rods of perforated I-beam section are fitted from the rear of the main frame to the brake hanger on the axle, and tubular rods are similarly fitted to the front axle fitting. The main frame is rectangular in plan but is dropped along the longitudinals to give the characteristic Colonial effect to the body. This suspension provides elasticity that is not short of remarkable. The steering knuckles are canted so that their pivot centers will intersect the center of the wheels, and thus give a caster effect. The yoke is fitted to the wheel and the pivot stub to the axle, a ball-thrust bearing being fitted at the top to take the upward thrust.

Steering is direct from a side lever with weighted ball grip, control being as usual on the left side. A "master controller" system is used, the operator having merely

direction. On the higher running speeds the car motor has its shunt weakened, gaining speed at the expense of power output. There are two brakes, one connected to the controller and returning the drum to off position when applied and the other merely operating one set of brakes on the hubs. Both sets operate similarly and are 12 inches in diameter. In the Colonial



FLANDERS MOTOR SUSPENSION

coupe model a compound switch is used for regulating the lights, the outer ring of the switch connecting the pillar head and tail lights in various combinations, and the inner push the canopy light. An amper-hour meter is fitted on top of the master controller casing in both open and

Baker electrics—Price range, \$1,000 to \$3,500. Shaft drive and long torque tube characterize the Baker product, with rear axle of the full-floating type. Other changes are of a minor nature, the line being notable chiefly for a new model, the five-passenger extension brougham, in which all passengers face forward. The wheel base of this model is 107 inches, and the fenders are skirted to the body to eliminate splash entirely. The seat next to the driver is swiveling, permitting facing in either direction. The controller is of the continuous torque type with lever moving horizontally over one of two segments, a lug on the lever running in a channel at the base of the segment for the forward speeds and in another near the top of the segment for the reverse speeds. To get into the reverse speeds it is necessary to lift the lever when at neutral position and slide it along the top of the segment when it can be dropped to engage the lug into the reverse channel. A sprocket and chain connects the base of the spindle on which the lever is mounted with the operating shaft of the controller drum, placed horizontally. The front end of the motor is connected to the frame by a large ball-joint, and a Renold silent chain is used to give the first reduction, as usual in Baker practice. The motor is of new four-pole design, and the commutator is

large, eliminating sparking and blackening. The brakes are of internal expansion type, both acting side by side on the same drum and fitted with equalizing bars. Cable sizes are enlarged to carry the higher currents of the 42-cell batteries used. Tires are 34 x 4 front and 34 x 4½ rear, of special electric type pneumatics. This model is priced at \$3,500, while the regular brougham is listed at \$3,100, and has similar improvements, but the controller is operated by lever and segment below the steering wheel. The remaining models are similar to those of former seasons.

Detroit Electric; price range, \$2,000 to \$3,850—Changes in the Detroit line are in the nature of refinements, the direct shaft drive with full floating rear live axle and triangular brace rods being continued among other features. The motor is still of moderate speed, 800 revolutions maximum per minute, and a reduction between it and the drive is unnecessary. Ball-bearings are used in the stub axles and rollers on the spindles. Brakes are internal expanding within drums on the hubs of the rear wheels and operated by foot pedals. But one chassis in several lengths of wheelbase is used for the various models; the limousine and town car being on the 112-inch wheelbase frame, and have wheel steering. The controller lever is arranged under the wheel on these cars with linkage

connections to the drum operating mechanism, while the lever steering models use the lever controller handle of previous seasons. The limousine seats eight and the town car seven passengers, including the driver.

Waverley Electric; price range, \$1,225 to \$3,500—Of the always attractive Waverley line, a five-passenger limousine with all facing forward is the only new offering, the chassis having a 104-inch wheelbase to suit the extra seating capacity. The driver sits on a fixed seat at the left front and there is fitted a swiveling chair alongside, the remaining passengers being accommodated on the single rear seat. In general details, the car follows standard Waverley practice, with lateral shaft drive from the first reduction gear to a herringbone gear reduction at the left of the live rear axle. Two universal joints are fitted to the shaft and there is claimed to be an efficiency of 98.7 per cent. between the first reduction and the live axle. The controller is operated by drum-handle and short reversing lever as in other models and four speeds in either direction are provided. Braking is by drums on the hubs with internal expanding bands operated by foot pedals, and the springing is full elliptical all around. The battery is carried in two units, of 17 cells each in boxes forming the front and rear of the body work, and en-

trance is by a single side door on each side. This model, known as the "Limousine-Five" lists at \$3,500, while the brougham, priced at \$2,800, is nine inches longer than the corresponding model for 1911.

Grinnell Electric; price, \$3,000—An extension front brougham with shaft drive to full floating rear axle is the only model displayed. The front axle is of the tubular type, with ball-bearing steering head, while the rear axle has the load carried on F. & S. ball-bearings directly under the spokes of the wheels. Alloy steels are used for the driving members and the double internal expanding brakes are pedal operated. Full elliptical springs are used all around with cushion tires. The controller is of the drum, continuous torque style with vertical operating handle. A Yale lock with key on the side panel of the body enables the lever to be locked at neutral and prevents unauthorized use of the car. Two universal joints are fitted in the drive, and five speeds in either direction are provided. A Sangamo ammeter is part of the regular equipment. The wheelbase is 90 inches and the tread 56, so that the car will track with all carriages on country roads, etc. The fenders are full skirted to the body and are leather covered. Five passengers are carried, three facing forward on the rear seat and two rearward on the front seat.

Summary of the Cars and Motorcycles Displayed at the Garden Show

American Locomotive Co., Providence, R. I.—Two Alco cars. One six-cylinder Berline, one four-cylinder touring car, one six-cylinder chassis.

American Motor Car Co., Indianapolis, Ind.—Three American underslung cars. Two four-cylinder touring cars, one four-cylinder roadster, one four-cylinder chassis.

Atlas Motor Car Co., Springfield, Mass.—Two two-cycle Atlas cars. One four-cylinder touring car, one two-cylinder landaulet.

Brush Runabout Co., Detroit, Mich.—Three Brush and two Courier cars. Two four-cylinder, shaft-driven Courier touring cars; three single-cylinder, chain-driven Brush runabouts, and one four-cylinder Courier chassis.

Buick Motor Co., Flint, Mich.—Five four-cylinder Buick cars. Two each roadster and touring cars, one torpedo and one chassis.

Case Co., J. I., Racine, Wis.—Four four-cylinder Case cars. One each limousine torpedo, roadster and coupe, and one chassis.

Cadillac Motor Car Co., Detroit, Mich.—Four four-cylinder Cadillac cars. One each torpedo, touring car, coupe and Berline, and one chassis.

Cartercar Co., Pontiac, Mich.—Four four-cylinder, friction driven Cartercars. One each touring car, torpedo, roadster and colonial coupe, and one chassis.

Chalmers Motor Car Co., Detroit, Mich.—Four Chalmers cars. One six-cylinder touring car, two four-cylinder touring cars, one four-cylinder Berline and one four-cylinder chassis.

Columbia Motor Car Co., Hartford, Conn.—Three four-cylinder, Knight-engined Columbia cars. One each touring car, torpedo, and limousine and one chassis.

Corbin Motor Vehicle Corporation, New Britain, Conn.—Four four-cylinder Corbin cars. Three touring cars, one roadster.

Dayton Motor Car Co., Dayton, Ohio—Three Stoddard-Dayton cars. One each four-cylinder touring car and roadster; one six-cylinder, Knight-engined Berline, and one four-cylinder chassis.

Elmore Mfg. Co., Clyde, Ohio—Two two-cycle Elmore cars. One four-cylinder roadster, one two-cylinder roadster.

Franklin, H. H., Mfg. Co., Syracuse, N. Y.—Four six-cylinder, air-cooled Franklin cars. Three touring cars, one limousine.

Garford Co., The, Elyria, Ohio—Four Garford cars. One each six-cylinder touring car and Berline; one each four-cylinder touring car and limousine, and one six-cylinder chassis.

Haynes Automobile Co., Kokomo, Ind.—Four four-cylinder Haynes cars. One each touring car, limousine, roadster and colonial coupe, and one chassis.

Hudson Motor Car Co., Detroit, Mich.—

Three four-cylinder Hudson cars. Two touring cars, one roadster and one chassis.

Inter-State Automobile Co., Muncie, Ind.—Three four-cylinder Inter-State cars. One roadster, two touring cars and one chassis.

Jackson Automobile Co., Jackson, Mich.—Four four-cylinder Jackson cars. Three touring cars, one roadster and one chassis.

Knox Automobile Co., Springfield, Mass.—Five Knox cars. One six-cylinder race-about, one six-cylinder touring car, two four-cylinder touring cars, one four-cylinder Berline.

Locomobile Co. of America, Bridgeport, Conn.—Four Locomobile cars. Two six-cylinder touring cars, one six-cylinder limousine, one four-cylinder touring car and one six-cylinder chassis.

Lozier Motor Co., Detroit, Mich.—Three six-cylinder Lozier cars. One each touring car, torpedo, and Berline, and one six-cylinder chassis.

Marquette Motor Co., Saginaw, Mich.—Three four-cylinder Marquette cars. Two touring cars and one torpedo, and one four-cylinder polished chassis.

Matheson Automobile Co., Wilkes-Barre, Pa.—Two six-cylinder Matheson cars. One touring car and one roadster, and one six-cylinder chassis.

Maxwell-Briscoe Motor Co., Tarrytown,

N. Y.—Five Maxwell cars. Two four-cylinder roadsters, two four-cylinder touring cars, one two-cylinder runabout, and one four-cylinder chassis.

Mercer Automobile Co., Trenton, N. J.—Four four-cylinder Mercer cars. One each touring car, raceabout, roadster, racing car, and one chassis.

Metzger Motor Car Co., Detroit, Mich.—



Four Everitt cars. One each six-cylinder touring car and roadster; two four-cylinder touring cars, and one six-cylinder chassis.

Mitchell-Lewis Motor Co., Racine, Wis.—Four Mitchell cars. Two six-cylinder touring cars, one four-cylinder roadster, one four-cylinder touring car, and one six-cylinder chassis.

Moline Automobile Co., East Moline, Ill.—Two four-cylinder Moline cars. One each touring car and roadster.

Moon Motor Car Co., St. Louis, Mo.—Four four-cylinder Moon cars. Three touring cars, one roadster and one chassis.

National Motor Vehicle Co., Indianapolis, Ind.—Four four-cylinder National cars. Three touring cars and one roadster.

Nordyke & Marmon Co., Indianapolis, Ind.—Three four-cylinder Marmon cars. Two touring cars, one Berline and one chassis.

CENSUS OF THE SHOW

Total Exhibitors	405
Exhibitors of Cars	60
Exhibitors of Accessories...	329
Exhibitors of Motorcycles...	16

GASOLENE CARS

One Cylinder	3
Two Cylinders	1
Two Cylinders (two-cycle)...	2
Four Cylinders	124
Four Cylinders (two-cycle)...	4
Four Cylinders (sleeve valve)...	6
Six Cylinders	48
Six Cylinders (sleeve valve)...	1

Total Gasolene Pleasure Cars.... 189

Touring Cars	112
Roadsters	37
Limousines	15
Beflines	12
Coupes	5
Phaetons	3
Landaulets	2
Raceabouts	3

189

Air Cooled Cars..... 4

Water Cooled Cars..... 185

189

CHASSIS

Four Cylinders	27½
Six Cylinders	14

41½

ELECTRIC CARS

Coupes	9
Runabouts	2
Broughams	2

13

Special Exhibits—

Racing Cars	3
Glidden Trophy Winner....	1

4

Grand Total all Cars and Chassis 247½

one four-cylinder coupe and one six-cylinder touring car.

Packard Motor Car Co., Detroit, Mich.—One six-cylinder Packard phaeton and one six-cylinder chassis.

Palmer & Singer Mfg. Co., Long Island City, N. Y.—Four Palmer-Singer cars. One each six-cylinder touring car and runabout; one each four-cylinder touring



car and roadster, and one four-cylinder polished chassis.

Peerless Motor Car Co., Cleveland, Ohio—Four six-cylinder Peerless cars. Three touring cars and one Berline.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Four six-cylinder Pierce-Arrow cars. Two each limousines and touring cars, and one six-cylinder chassis.

Pope Mfg. Co., The, Hartford, Conn.—Three Pope-Hartford cars. One each four-cylinder touring phaeton and limousine, one six-cylinder touring car and one six-cylinder chassis.

Premier Motor Mfg. Co., Indianapolis, Ind.

—Three Premier cars. One each six-cylinder touring car and cabriolet, one four-cylinder touring car and one six-cylinder chassis.

Pullman Motor Car Co., York, Pa.—Four Pullman cars. One six-cylinder touring car, two four-cylinder touring cars and one four-cylinder roadster.

Reo Motor Car Co., Lansing, Mich.—Three four-cylinder Reo cars. Two touring cars, one roadster and one chassis.

Two four-cylinder valveless Amplex cars, one limousine and one touring car.

Speedwell Motor Car Co., Dayton, Ohio.—Two four-cylinder Speedwell cars, both touring cars, and one four-cylinder polished chassis.

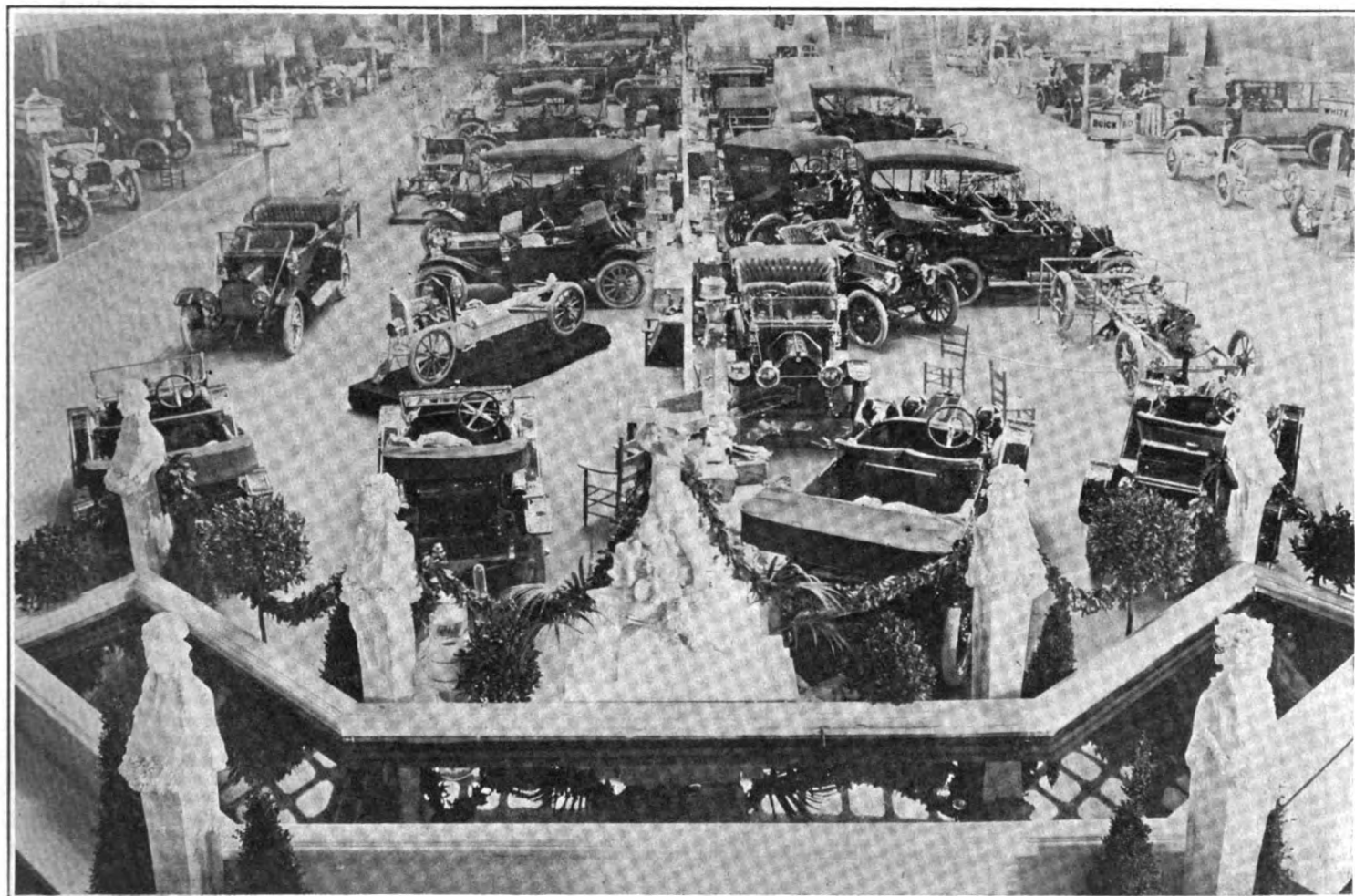
Stearns Co., F. B., Cleveland, Ohio—Two four-cylinder, Knight-engined Stearns cars. One roadster and one limousine, and one four-cylinder, Knight engined chassis.

White Co., The, Cleveland, Ohio.—Four White cars. One six-cylinder touring car, one each four-cylinder touring car, Berline and roadster.

Willys-Overland Co., Toledo, Ohio—Four four-cylinder Overland cars, all touring cars, one four-cylinder chassis.

Winton Motor Carriage Co., Cleveland, Ohio—Four six-cylinder Winton cars. Three touring cars, one Berline and one six-cylinder chassis.

CENTRAL SECTION OF THE SHOW AS VIEWED FROM "ALOFT"



HOW THE EXHIBITS ON THE MAIN FLOOR APPEAR FROM THE TOP GALLERY

Selden Motor Vehicle Corporation, Rochester, N. Y.—Three four-cylinder Selden cars. Two touring cars, one limousine and one chassis.

S. G. V. Co., Reading, Pa.—Two four-cylinder S. G. V. cars. One each touring car and landaulet, and two four-cylinder chassis.

Simplex Automobile Co., New York City—Four four-cylinder Simplex cars. One chain-driven limousine, one chain-driven touring car, one shaft-driven limousine and one shaft-driven touring car; one chain-driven and one shaft-driven chassis.

Simplex Motor Car Co., Mishawaka, Ind.—

Stevens-Duryea Co., Chicopee Falls, Mass.

—Three six-cylinder Stevens-Duryea cars. One each limousine, touring car and roadster, one six-cylinder chassis.

Studebaker Corporation, Detroit, Mich.—Two four-cylinder E-M-F cars and two four-cylinder Flanders cars. One E-M-F touring car, one E-M-F roadster, one Flanders touring car, one Flanders roadster, one one-half Flanders four-cylinder "sliced" chassis.

Thomas, E. R., Motor Car Co., Buffalo, N. Y.—Two six-cylinder Thomas cars. One each touring car and surrey, and one six-cylinder chassis.

Electrics.

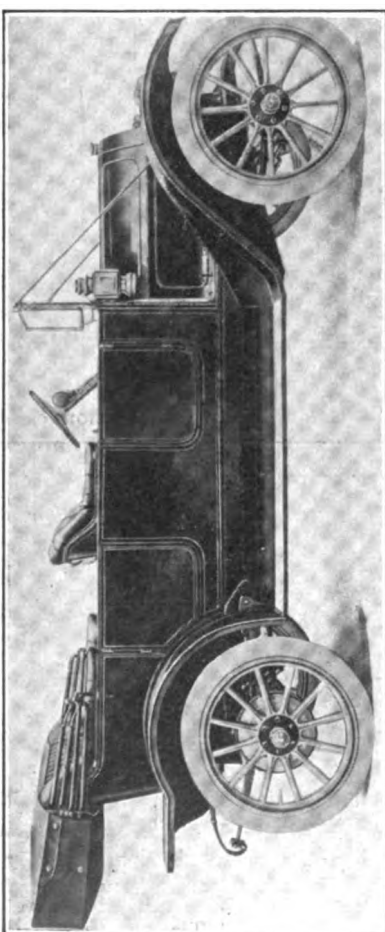
Anderson Electric Car Co., Detroit, Mich.—Three Detroit cars. One each coupe, brougham and runabout.

Baker Motor Vehicle Co., Cleveland, Ohio—Three inside driven coupes.

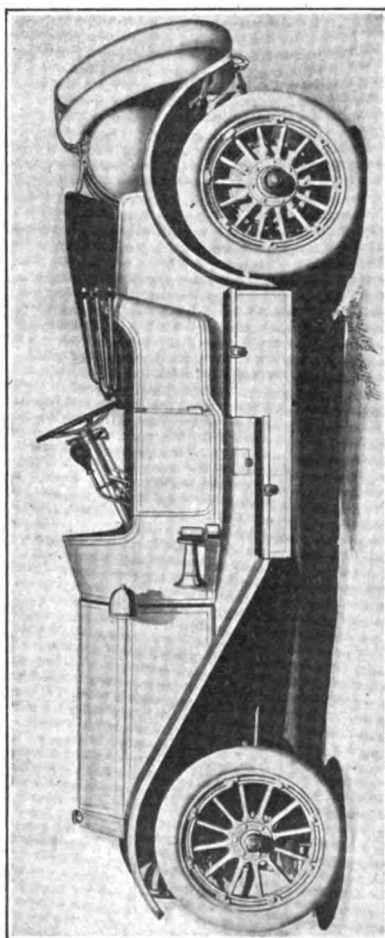
Flanders Mfg. Co., Pontiac, Mich.—Two Flanders coupes.

Grinnell Electric Car Co., Detroit, Mich.—One Grinnell coupe.

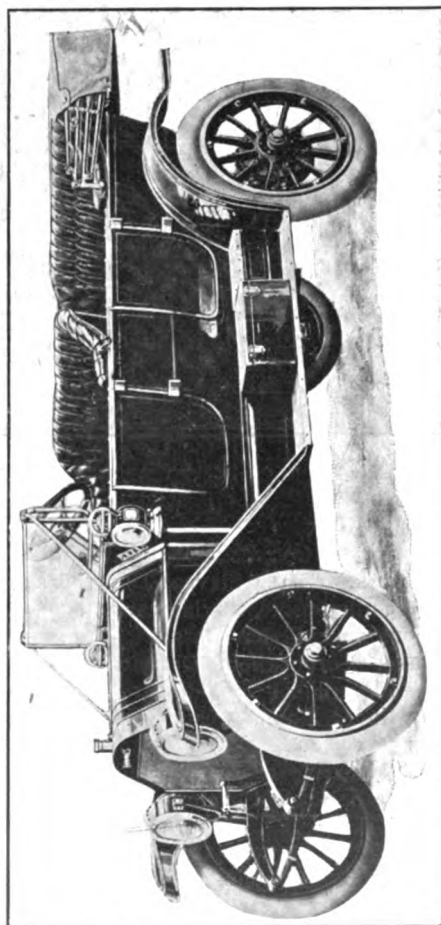
Waverley Co., The, Indianapolis, Ind.—Four Waverley cars. One brougham, one five-passenger limousine, one coupe and one runabout.



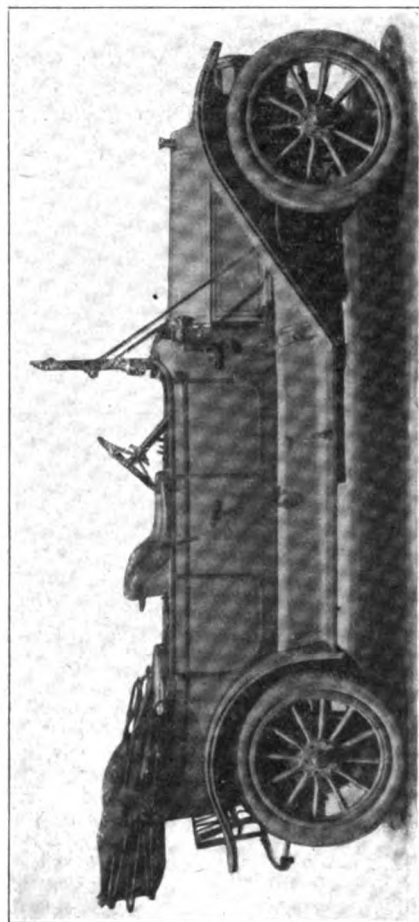
THE REDESIGNED "REO THE FIFTH"



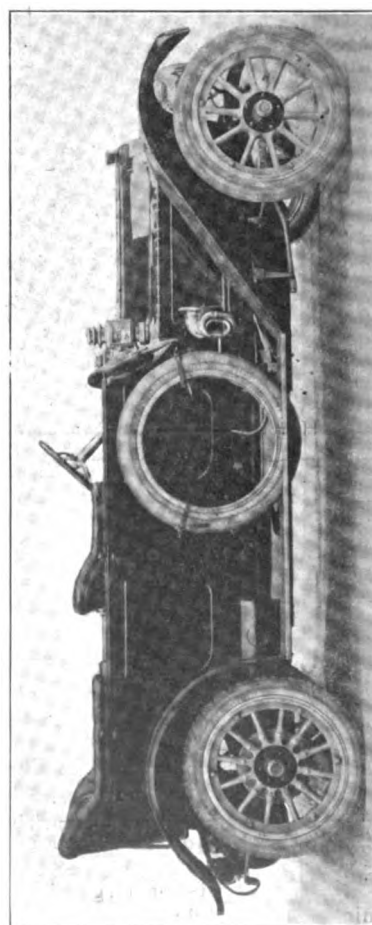
STODDARD-DAYTON-KNIGHT COMPARTMENT ROADSTER



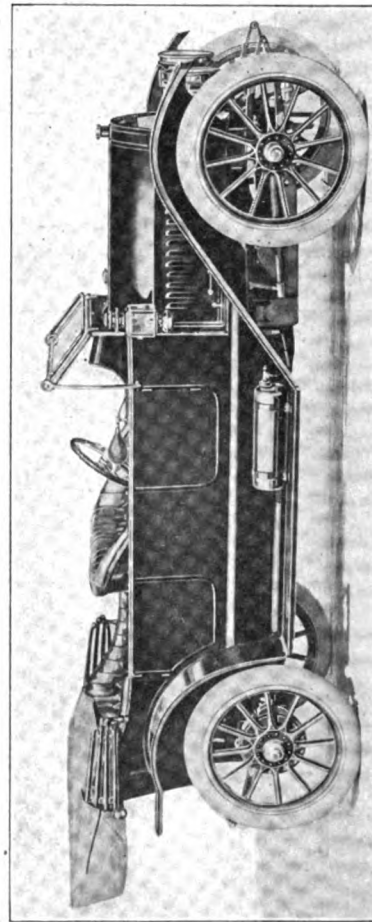
FIVE-PASSENGER CLOSED-FRONT HAYNES



THE 36-HORSEPOWER PIERCE-ARROW



PALMER-SINGER "BRIGHTON-SIX"



FIVE-PASSENGER JACKSON TORPEDO

TIRE S&RIMS

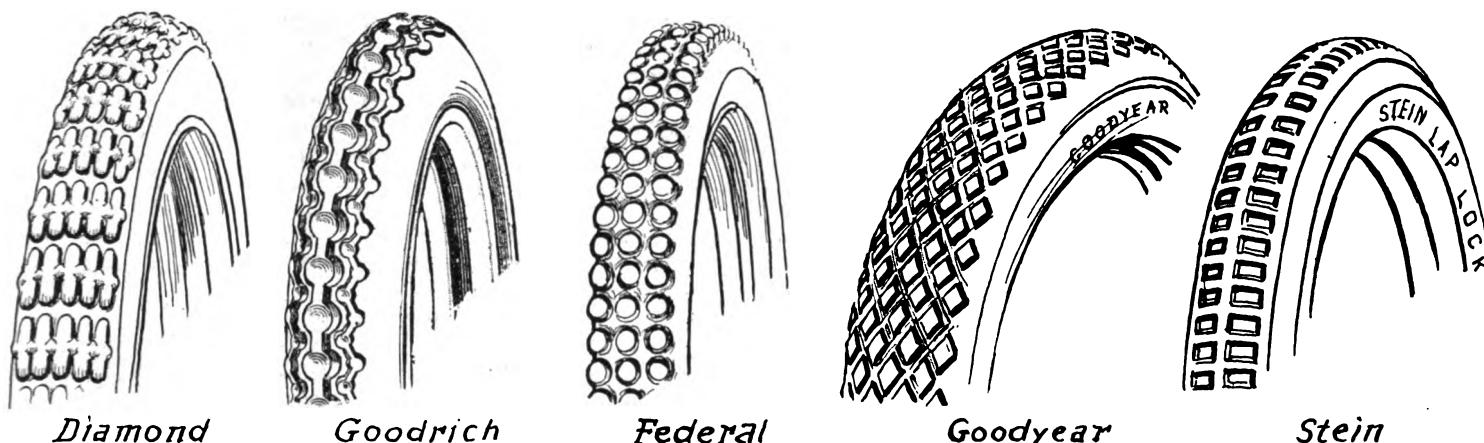
As might have been expected from the present advanced state of the tire industry there are few radical improvements or changes visible to the critical or semi-critical eye in the construction of the fabric the tread or flanges of the various brands of tires shown. Though two more manufacturers have adopted "straight edge" tires, most of the ingenuity has centered in the development of non-skid treads, it being significant that three of the oldest and largest makers, Diamond, Goodrich and the United States Tire Company, each has discarded former designs and brought out treads of new pattern for which strong claims are made.

studs are placed zigzag along the sides of the tire. Besides this non-skid tire the Goodrich company shows a new pneumatic truck tire, for trucks under 1½ tons, with flat corrugated tread, which is guaranteed only under condition that the speed of the truck does not exceed 20 miles per hour.

More fantastic in its non-skid feature is the "Daisy" tire shown by the Portage Rubber Co., Akron, Ohio, in which the protuberances take the well-defined shape of forget-me-nots. Diamond-shaped raised studs serve to identify the non-skid tire of the Goodyear Tire & Rubber Co., Akron, Ohio, while the Swinehart Tire & Rubber

public Rubber Co., Youngstown, Ohio; Stein Double Cushion Co., Akron, Ohio; Pennsylvania Rubber Co., Jeannette, Pa.—all of which continue their offerings of last year, without material changes.

The "no-rim-cut" feature also shows several converts, these including the Empire Tire Co., Trenton, N. J., which exhibits several wrapped tread "straight edge" tires, as well as a non-skid with "Checkered Tread" design, and the Shawmut Tire Co. Truck tires in both twin and single types are shown by the Swinehart Tire & Rubber Co., which exhibits a huge 48 x 6 single cellular non-skid solid tire and a 42 x 5 dual solid; by the Firestone, Republic,



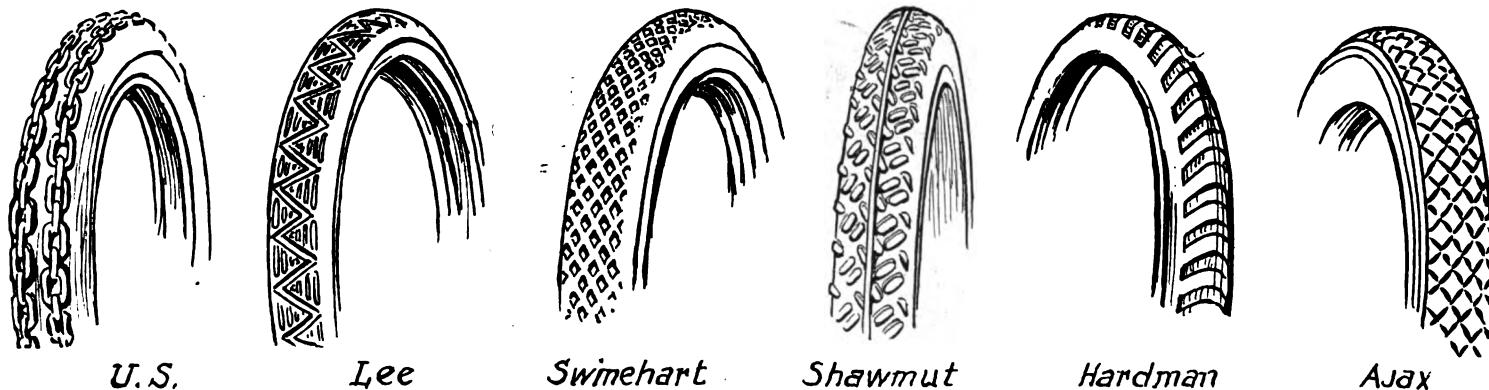
ILLUSTRATIVE OF THE TRENDS IN THE PRODUCTION OF ALL-RUBBER NON-SKIDS

In the Diamond design which is styled the "Safety" tread, the opposition to skidding is offered by successions of elongated and cross-barred ridges, running lengthwise around the circumference of the tire, and which are claimed to exert a "squeeze" effect. For the first tire bearing the brand "United States," which will succeed the long familiar Hartford, Morgan & Wright, G & J and Continental brands, the United States Tire Co. has adopted a "chain tread," in which the raised portions are shaped like open chain links. Probably this new non-skid tire would attract more attention were it not completely overshadowed by an enormous Morgan & Wright "Nobby Tread" truck tire, 38 x 8 inches, which, mounted on a disk steel wheel and pumped up to 150 pounds pressure, occupies the foreground in the interest of the visitors. Other United States tires in plain, corrugated and steel studded treads fill the remainder of the exhibit of this company. The "Master Tread" is the new non-skidding design to which the B. F. Goodrich Co., of Akron, Ohio, pins its faith; it consists of large round studs running in a straight line along the center of the tread, while smaller circular

Co., of the same Ohio city, uses diamond-shaped depressions to give anti-skidding service. Approaching closely to the old Bailey tread style, the new "Rugged Tread" of the anti-skid tire offered by the Federal Rubber Mfg. Co., Milwaukee, Wis., yet differs from that type in that its studs are shortened in the center row, while the two side rows are full length, thus forming a wide flat tread. St. Andrews crosses stretch circumferentially around the tire of the Standard Tire & Rubber Co., Boston, Mass., while arrowheads stud the surfaces of Prowodnick tires, shown by the Russian Tire Co., New York City; the Seamless Rubber Co., New Haven, Conn., and the Hardman Tire & Rubber Co., New York City; the product of the last named company differing from all others, however, in the manner of manufacture, as its tires are single cured, instead of molded, the corrugations stopping at the flange. Other non-skid tires, the features of which are too well known to require detailed description, are shown in the exhibits of the Ajax-Grieb Rubber Co., New York City; the Firestone Tire & Rubber Co., Akron, Ohio; the Shawmut Tire Co., Boston, Mass.; Re-

United States, Consolidated and Pennsylvania companies, J. L. Gibney & Bro., and by the Portage Rubber Co. The tire shown by the latter company for the first time in any show is constructed of blocks, each molded on a steel plate in such a way that bolts can be passed through the plate and fastened to the rim. Each section can be removed independently in a few minutes, even by a person unfamiliar with tires.

Inner tubes, patches, repair kits, reliners, protectors and fillers are present in profusion, the most striking exhibits being found in the booth of the National Rubber Co., St. Louis, Mo., where "Tirennew" and "Leakanot" are shown. The former of these preparations is intended for use on spare tires and on rubber matting, as well as for preserving the tires of stored cars, while the latter is used for waterproofing leather, by coating the leather surface with a film of Para gum. Other well-filled booths showing tires and tire accessories are occupied by the Fisk Rubber Co., Shawmut Tire Co., Voorhees Rubber Mfg. Co., Federal Rubber Mfg. Co., Endurance Tire & Rubber Co., Standard Tire & Rubber Co., Double Fabric Tire Co., Essex Rubber Co.,



MORE NON-SKID TREADS THAT COMBINE UTILITY AND DISTINCTIVENESS

Charles O. Tingley and the Charles H. Tucker Co., while wrapped tread tires of the same style as in former years are shown by the Batavia Rubber Co., Prince Tire Co. and Consolidated Rubber Tire Co. Rubber clothing and tubing are exhibited by Hodgman Rubber Co., Gilbert Mfg. Co., William R. Laidlaw and the Nathan Novelty Mfg. Co. The well-known Motz cushion tires again are shown by the Motz Clincher Tire & Rubber Co., of Akron, Ohio. Somewhat similar to the Motz tires are the Dayton airless tires exhibited by C. J. Cross & Co. Although on the market for some time they have not been shown before in New York, and attracted considerable attention. They resemble on the outside the ordinary pneumatic, but instead of being airtight and pumped up to high pressure they depend on rubber blocks for resiliency.

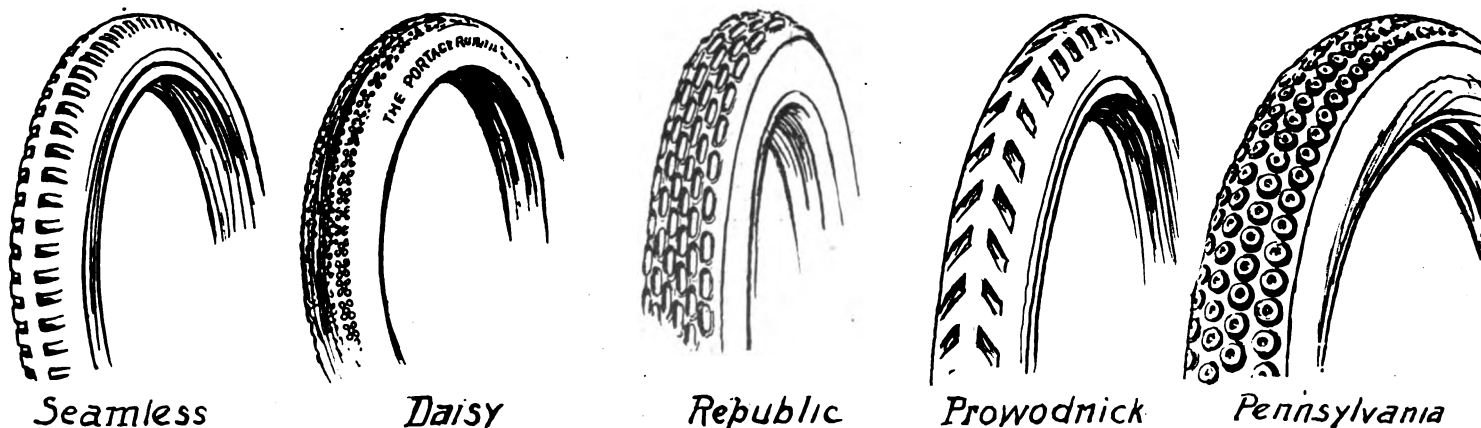
More ingenuity is shown to have been developed in the past year in the matter of demountable rims, of which no less than seven new styles are shown in the Garden, two of which are adapted to wire wheels. One of these is the Booth demountable rim, which now is offered in both styles (for wooden and wire wheels) while the American Rim Co., also, brings out a rim for wire wheels, which, however, is built exactly like the one made for wooden artillery wheels, which latter has been on the market for some time. In the new Booth demountable rim for wire wheels, the worm gear system, long familiar to the trade as incorporated in the wooden wheel, is used—the turning of three bolts opening channels

through which lugs can be slid. The channel rim used in connection with this wheel is built especially strong and rigid, permitting all of the wire spokes to be drawn to a uniform tension without distorting the rim from a true circle. The other new offering of the Booth Demountable Rim Co. is a quick detachable split ring for clincher tires. It is fitted with a taper pin lock, which draws the edges of the rim to a solid contact and into vertical alignment while the channel rim with inner edge bearing against the large end of the taper pin locks them into horizontal alignment. Another rim is shown by the Newmastic Tire Co., whose main exhibit consists of the tire compound marketed under that name for several years. The Newmastic rim is held by twelve nuts and bolts, nine of which must be removed before the wedge rim can be taken off. A unique feature of the bolts is a small coiled spring which forces the nut and clamp off the rim, obviating the necessity of prying the clamps off with the fingers or special irons. A demountable rim of unusual construction is shown by Snyder & Harbridge. It is the product of the Detroit Demountable Rim Co., and consists of a loose rim, from which a small section near the tire valve has been removed. The two sections are joined and locked by a simple locking device consisting of a rectangular piece fitting into the cut-out portion of the rim and an "S" shaped lock. The loose rim, carrying the tire, is held in place on the felloe by six wedges of bolt-and-draw construction, in

which the nut is securely attached to the wedge in a novel manner, so that removing the nut withdraws the wedge at the same time. Other demountable rims familiar to the show visitors of last year are the Lambert, in which a ratchet device attached to the locking nut prevents any slipping or unloosening of the nut by shocks and jars; the Baker Universal, marketed by the Baker Rim Co., of New York, in which five bolts hold wedges in place, which may be turned to one side to allow of the rim being removed; the Hartford, Continental, Fisk, Morgan & Wright and Firestone dual, all of which were displayed last year.

Of course, the show would have been incomplete without at least one representative of the 11,000-and-odd patented spring wheels evolved, invented or constructed. It is composed of "S" shaped flat steel springs in place of the spokes and carries a steel studded solid rubber tire. Its brightly polished steel draws many curious questioners to the booth of the Simonds Mfg. Co., where it is shown.

One of the surprises of the show, and one which caused no little comment was the absence of Michelin from the Garden. A tire exhibit without the Bibendum twins seemed incomplete, and many were the questions asked as to the why and wherefore of their non-appearance. The crowing rooster in scintillating colors which tops the pyramid of Goodrich tires, however, furnishes a subject of discussion that soon chases the thought of Michelin from one's mind.



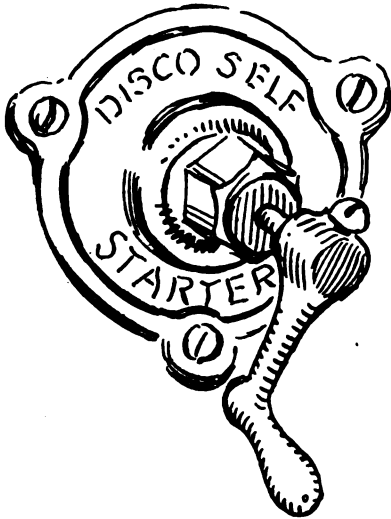
AND STILL MORE DIVERSITY IN THE DESIGN OF NON-SKID TREADS

ENGINE STARTERS

In the realm of the self-starter there is almost unlimited field for development, and it might be said in passing that there is very little of the field that has not been explored with fruitful results. At the Garden there are just about a baker's dozen of

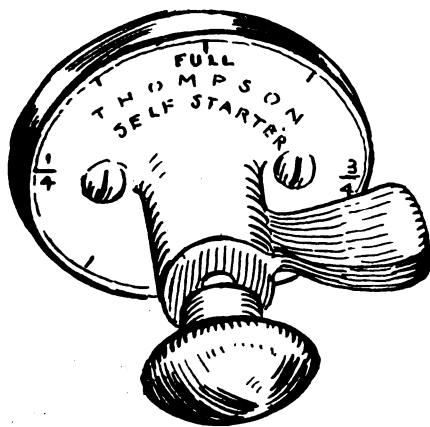
stock equipment on quite a number of cars. The whole system is delightfully simple and consists of a rotary valve, check valves which are screwed into the engine cylinders and several lengths of very fine copper tubing. From the ordinary type of acetylene gas tank, the gas is piped to the dash-located rotary valve and thence by means of separate pipes to the various cylinders. The master valve is controlled by a small handle, one complete turn of which serves to permit the gas under pressure in the tank to be admitted to all the cylinders in a quantity sufficient to guar-

ally controlled by a diaphragm, the Safety starter, manufactured by the E. A. Whitehouse Mfg. Co., and the Le Compte Mfg. Co., differs from the others in that gas is admitted to the engine manifold instead of to the cylinders. The system embraces a dash valve which also is an ignition switch, a single movement of the valve serving to break the ignition circuit and at the same time turn on the acetylene gas which is



DISCO CONTROL MECHANISM

different makes displayed and they are of four general types which may be classed under the sub-heads, Acetylene, Electric, Compressed Air and Mechanical, the last division serving to distinguish from the others those which are of a purely mechanical nature and are either hand or spring operated.



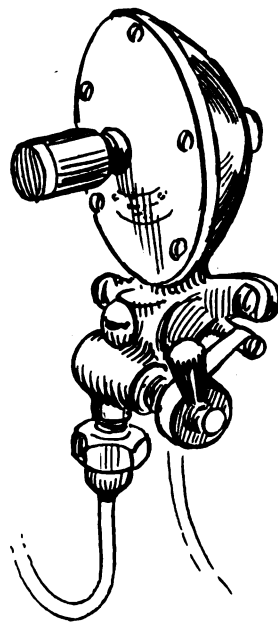
THOMPSON MASTER VALVE

It is perhaps natural that the acetylene type of starter should be the most popular of the four by reason of its inherent simplicity and the fact that it can be attached to almost any motor in the minimum of time and at slight expense. Of the five different makes of acetylene starter exhibited, the Disco probably is the most widely known by reason of its incorporation as

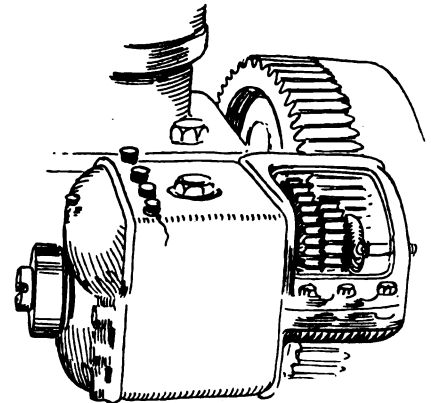
antee an explosion in one of them the instant the ignition current is switched on.

The Thompson starter operates on exactly the same principle, though the essential parts are slightly different, the master valve being operated by a push button and so constructed that it permits the use of only a measured quantity of gas for every start. Its most distinctive feature is the incorporation of an auxiliary valve which governs the amount of gas admitted to the cylinders, according to the amount of pressure in the acetylene tank. For instance, if the tank is full, the auxiliary valve which is formed integral with the push button and located on the dash, is set according to a dial marked off in divisions corresponding to quarter, half, three-quarter and full pressure in the tank. As the pressure in the tank drops the auxiliary valve is set accordingly to admit the proper amount of gas to the cylinders.

Incorporating a safety valve automatic-



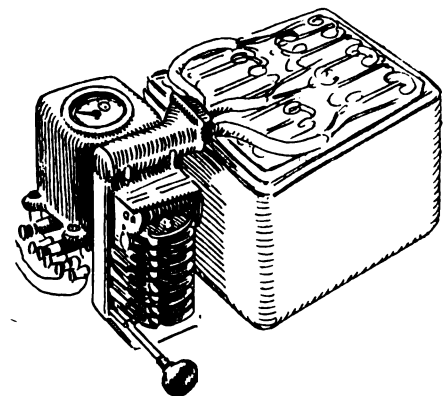
"SAFETY" SELF-STARTER



DELCO MOTOR GENERATOR

drawn into the cylinders during the last few revolutions before the motor stops. The motor therefore is made automatically self-starting merely by being stopped.

The Stacy starter, also of the acetylene type, is unique in that it includes a small electric motor which operates a blower, a rotary distributing valve also operated by the motor, and an automatic pressure re-

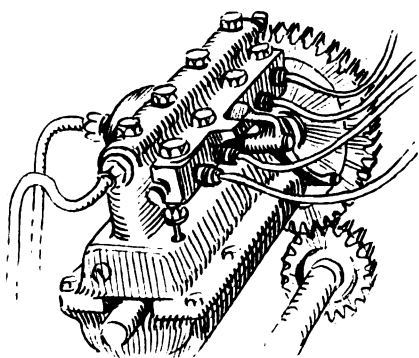


DELCO CONTROLLER UNIT

ducing valve which attaches to the acetylene tank. The modus operandi of the system is as follows: When a small button on the dash is pushed, the electric motor is started and the blower draws in air with which it mixes acetylene gas, the mixture being distributed to the cylinders through the motor operated distributing valve.

Though acetylene starters apparently are

the most popular at present, electric starters almost daily are looming larger, and according to the signs of the times bid fair soon to rival the other type in point of popularity. Which is due in a large measure to the fact that the electric starter permits the combination of lighting, ignition and starting systems all in one without undue complication. The Delco is one of the systems which feature this combination. In its simplest aspect it consists of three parts, viz., a motor-generator, a battery and an automatic switch. When the generating unit is used to start the engine it drives through gearing on the periphery of the flywheel of the motor, and when the motor is running, the generator is driven by it through a shaft from the timing gear train. In order to achieve these functions an ingenious automatic device is used and oper-



STARTLITE AIR COMPRESSOR

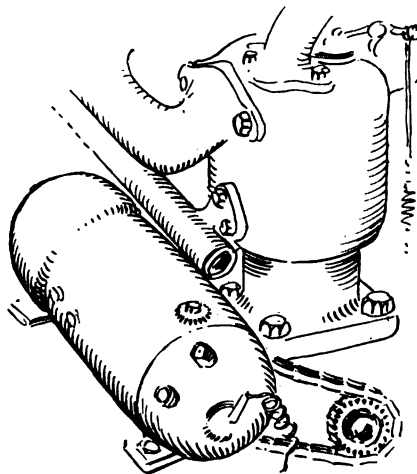
ates to connect the generator to the engine through the flywheel gearing when the spark control lever is placed in the full retard position and the clutch pedal depressed. Immediately the engine commences to fire, the flywheel gears are automatically thrown out of mesh and the generator is driven through the timing gears as stated; when the engine is stopped an automatic cut-out disconnects the generator from the battery to prevent the latter becoming exhausted. The battery itself is maintained constantly charged and current from it serves to operate the ignition apparatus and also to light the lamps.

The Deaco system, manufactured and exhibited by the Detroit Electric Appliance Co., differs from the others in that the motor-generator is a combination high tension magneto, low tension generator and motor. It is arranged to drive the engine as a starter, or to be driven by the engine as a generator and a magneto, just as the ordinary magneto is, i. e., through the timing gear train. The remainder of the system includes a storage battery and an automatic cut-out to disconnect the battery from the generator when the engine is idle and to connect them immediately the engine is started.

One of the particular features of the North East electric starting and lighting system lies in the use of a unique form of dash switch. To start the engine it is merely necessary to turn on the ignition

current and move the starting switch to the starting position, which permits current to flow from the battery to the motor-generator. Immediately the engine starts, the starting switch is released and is returned to the normal position by means of a spring. The motor-generator is unusually compact and is connected to the engine through the timing gears.

Instead of being connected to the engine through the timing gear train, which is the usual custom, the Paris electric starter, manufactured and exhibited by the



PARIS ELECTRIC STARTER

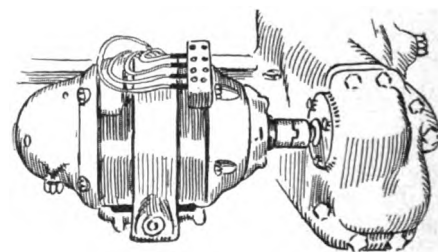
Paris Electric Starter Co., is connected to the crankshaft by means of a chain of the silent type. By means of electrically operated clutches, the speed ratio of the generator to the crankshaft of the engine is varied automatically according to whether it is used to start the engine, when the ratio is low, or to furnish current to charge the storage battery, when the ratio is higher. The orthodox type of storage battery and cut-out switch complete the system.

The Hartford electric starter, which is manufactured by the Hartford Suspension Co., embraces an exceptionally small and compact motor-generator unit, which is connected to the engine through the timing gear train by means of a worm and wheel. As becomes the product of the manufacturers of the well-known Truffault-Hartford shock absorbers, the machine is strongly built and beautifully finished.

There are only two starters of the compressed air type on view, and of these the Startlite is unique in that it incorporates a distributor in which the valves are of the piston type. Another of its distinctive features is that by means of a diaphragm operated by air pressure in the tank, the four-cylinder compressor is thrown out of action when the pressure reaches a certain predetermined limit. Similarly, when the pressure drops below a certain figure the pump automatically is put in operation. The four piston valves, one for each cylinder, are operated by means of a miniature camshaft in the body of the pump. A button on the dash serves to admit the compressed air to the distributor valve.

The other compressed air starter is manufactured and exhibited by Janney, Steinmetz & Co. and embraces a vertical, air-cooled compressor, arranged to be driven through gearing in the most accessible place on the engine, and a rotary distributing valve. Substantial construction and adherence to standard and well-tried practice are its principal characteristics.

Showing scarcely a change worthy of note, the Gardner self-starter is shown in actual operation, and differs materially from any of the others that have been described. It is a spring device by means of which the crankshaft of the engine to which it is applied is given a number of quick turns sufficient to cause it to take up its regular cycle of operations. The spring itself is extremely powerful and is wound automatically by the momentum of the car and not by the engine. A simple band clutch, interconnected with the clutch pedal, grips the housing in which the spring is enclosed, and to which it is attached, when



NORTH EAST GENERATOR

the clutch pedal is depressed, the momentum of the car serving to rewind the spring each time after the engine has been started.

The Columbia starter, exhibited by Daniel H. Tower, is still different, and relies for its operation on the effort of the driver. A single lever placed in proximity to the other control levers is connected to a ratchet device which takes the place of the usual starting crank. Owing to its peculiar construction it is possible to crank the engine from the seat without danger of back-fires damaging the starter or harming the operator.

Opposite Effects of Water on Metals.

The process used to harden steel—heating and cooling by immersion in water—has exactly the opposite effect on hard brass or copper, which becomes very soft when thus treated. The stiffest, springiest brass wire or sheet becomes exceedingly soft and tractable when thus annealed. Slow cooling is not necessary, though it makes the metal a trifle softer.

To Fashion an Emergency Spring.

A fairly good spring can be made of a piece of flat brass or copper, even if soft, by hammering it lightly all over, on both sides, with many light blows. The effect is the same as the "hard-rolling" process, though not so thorough. Sometimes a spring thus made will answer until something better can be obtained.

ELECTRICAL EQUIPMENT

In the field occupied by ignition apparatus in general, little of a radical nature is in evidence, the great tendency being rather toward the simplification of details. Particular attention has been given the necessity for waterproof mechanisms and several manufacturers of magnetos have concentrated their efforts largely on the production of instruments to produce exceptionally hot sparks at low engine speeds and with full retard. Summarizing further, switching devices in general have been made more substantial to enable them to withstand the abuse which commonly is their lot and the apparatus is more compact.

Probably the greatest development is in the production of thoroughly waterproof magnetos and the instrument of this character which is exhibited by the Bosch Magneto Co. is decidedly ingenious in construction. It is styled type ZR4 and is an outgrowth of the DU4 type, which it closely resembles. The whole mechanism is completely enclosed, and plates fitting snugly to the magnets and a tight joint being insured by the insertion of felt packing; the joints between the magnets have been treated in a like manner and the whole exterior of the instrument is ground to a smooth finish. Considerable attention has been given the designing of the terminals with a view to preventing the escape of either high or low tension current, and the construction of the whole instrument is such that no live metal is exposed. The electrical efficiency of the instrument has been considerably increased by extending the pole shoes and forming them into broad fingers which reach out over the armature. The effect obtained is to cause the generation of a hot spark at as low as 75 revolutions a minute and also to increase the intensity of the spark when fully retarded. Flanked by an exceptionally large low tension magneto suitable for stationary gas engine work, the exhibit also includes the several other types of Bosch magneto, which have become familiar, and most of them are so mounted that those who so desire can make their own sparks.

A new type of Remy semi high tension magneto has been added to the standard line which bears this brand, and is styled model RD. It is of the inductor type, and features, among other things, a new style of inductor wings which are of laminated instead of cast steel. The front plate is a single casting of composition metal and the cam housing has been made slightly smaller though outside adjustment is retained. The distributor segment is molded in "Bakelite," which is a new insulating material

for which great strength and toughness are claimed. Permitting easy inspection of the distributor parts, a removable lid, held in place by means of a retaining spring is used. A new type of locking kick switch which may be mounted either on the transformer or at some isolated place, also is shown, as are double spark and truck type magnetos.

Splitdorf magnetos also have been further refined. Thus, in the model T the iridium-platinum contact points now are brazed into the breaker bar to preclude the possibility of their coming loose, and the transformers are made for either the front or back of the dash, and are fitted with a new type of kick switch constructed of metal instead of composition. Other types of magnetos which are shown include types J4, J6 and U4, the latter being a compact high tension instrument suitable for motors of up to 30-horsepower.

One of the features of the Briggs magneto, a comparatively new instrument which merits attention, in that it contains an oil reservoir under the arch of the magnets in which may be placed sufficient oil to last a whole season. The oil is fed to the bearings through a wick by capillary attraction. The reservoir may be filled without disturbing any of the elements of the instrument by means of a duct led up to the top of the arch of the magnets. A new model D instrument, suitable for two-cycle motors and having a timing range of 90 degrees has been added and together with an assortment of kick switches completes the exhibit.

In the magneto displayed by the Pittsfield Spark Coil Co. is revealed an instrument that embodies a number of distinctive features. Owing to the formation of the pole shoes, and the arrangement of the wiring a spark is produced every 90 degrees instead of every 180 degrees, which is the usual custom. The armature contains no wiring and is used merely to cut the lines of force and reverse the field. At the back of the magneto is an easily removable winding that is entirely waterproof and which causes the generation of unusually hot sparks at low rotative speeds of the armature.

Connecticut is another name that is associated with all that is constant in the ignition field and one of the minor improvements which have been made in the type A4 magneto which bears this brand is the incorporation of a tiny red electric light intended to act as a tell-tale and indicate to the driver that the battery side of the dual system is in use. The signal reduces the danger of the battery becoming exhausted,

due to the switch inadvertently being left closed when the engine is idle. The exhibit is completed by a full line of the other standard Connecticut products such as coils, timers, switches and distributors.

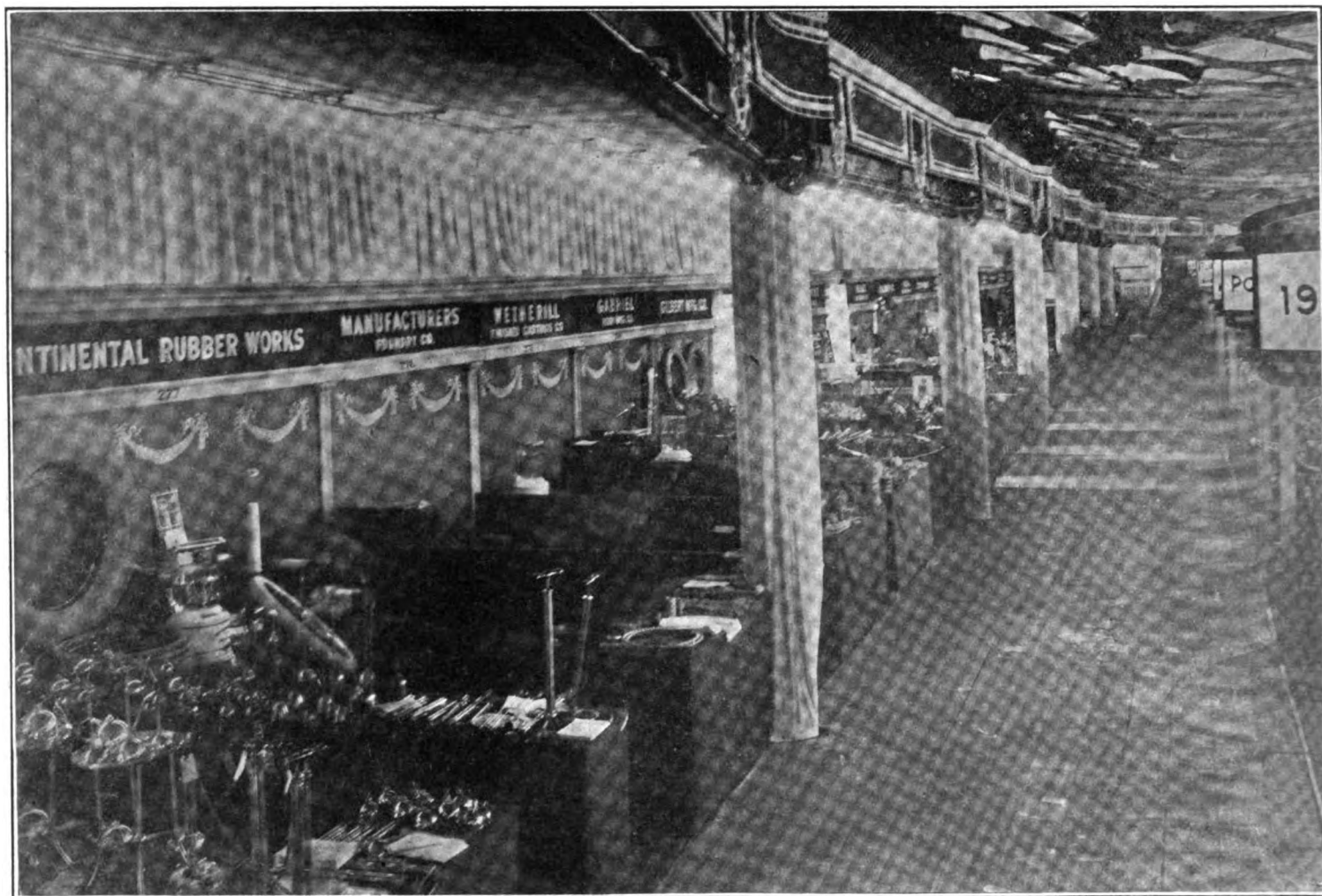
Distinctive by reason of the incorporation of an automatic centrifugally governed advance and retard, Eisemann magnetos have been changed in a manner calculated to increase their efficiency, and render their sparks more intense. The pole shoes have been re-formed, permitting the generation of hot sparks at as low as 60 revolutions of the armature a minute. A new type of flush dash switch has been added to the line, and it is fitted with a small lever to be used for starting on the battery.

Herz magnetos, as heretofore, are fully enclosed instruments that successfully defy the insidious advances of water or other foreign substances. Permitting the production of considerably hotter sparks at low armature rotative speeds, the magnets have been made slightly higher; otherwise the instruments remain unchanged.

"No Lag" magnetos, exhibited by the American Circular Loom Co., are novel inasmuch as they deliver current to the transformer in two separate circuits. Instead of distributing the high tension current to each spark plug whence it is returned through a ground wire, each pair of plugs in separate cylinders is connected in series. Thus the spark takes place in each pair simultaneously, one cylinder being on the firing and the other on the exhaust stroke. The spark which takes place in the cylinder which is on the exhaust stroke is for the purpose of cleaning the plug points, and at the same time intensifying the spark in the other cylinder. In other words, it serves principally as an auxiliary spark gap.

K-W magnetos in their familiar low tension form are exhibited by the K-W Ignition Co., and the line has been increased by the addition of two new instruments of the high tension type which are styled models J and HT. Both of them follow closely the lines of their low tension companions and produce hot dynamic sparks.

Distinguished by their unusually compact appearance due to the use of bell-shaped magnetos placed horizontally instead of the usual horseshoe members vertically. Mea magnets are shown by Marburg Bros., of New York. One other of their distinctive features is that by reason of their compact shape the whole magneto may be rocked on the shaft to obtain advance and retard which permits the production of sparks of the same intensity in either position.



LOOKING DOWN ONE OF THE AISLES ON THE SECOND BALCONY

The principal characteristics of the Heinze magnetos are the pole pieces which are round instead of flat, as usual. The ends of the magnets are fitted into holes reamed in the pole pieces, and as these are minus the usual interstices in the pole pieces of the ordinary magneto, a very powerful magnetic field is the result. The distributor and housing also are of the tubular type, though the armature and breaker follow standard practice.

In the National magneto, shown by the National Coil Co., the method of construction is unusual in that the contact breaker is operated from the half time shaft and as it therefore operates at comparatively slow speed its life is proportionately lengthened. Another of its peculiar features consists of a tiny timing window over an indicator, which designates the cylinder which is firing.

The Atwater Kent "Unisparker" has been improved by the addition of a small cartridge condenser shunted across the contact points, the effect being to intensify the spark produced and at the same time reduce the arc at the contact points. Also a new fastener has been adopted for the top which now is held in place by means of spring clips instead of a screw and wing nut. Another ignition system which operates on the

single spark principle is the B-S igniter. It is exhibited by the Briggs & Stratton Co., which company also shows a plug transformer and a new five-point lighting switch which is unusually simple in construction.

The New York Spark Coil Co., exhibits both the Rhodes Timer and coils of its own manufacture, which, used in conjunction, it is claimed, consume so little current that it scarcely is measurable. Featuring an armature of rather larger diameter than usual, the Kokomo magnetos, shown by the Kokomo Electric Co. are another make that rapidly is attaining prominence. The reason for the larger armature, it is explained, is to cause the production of good sparks at slow speeds.

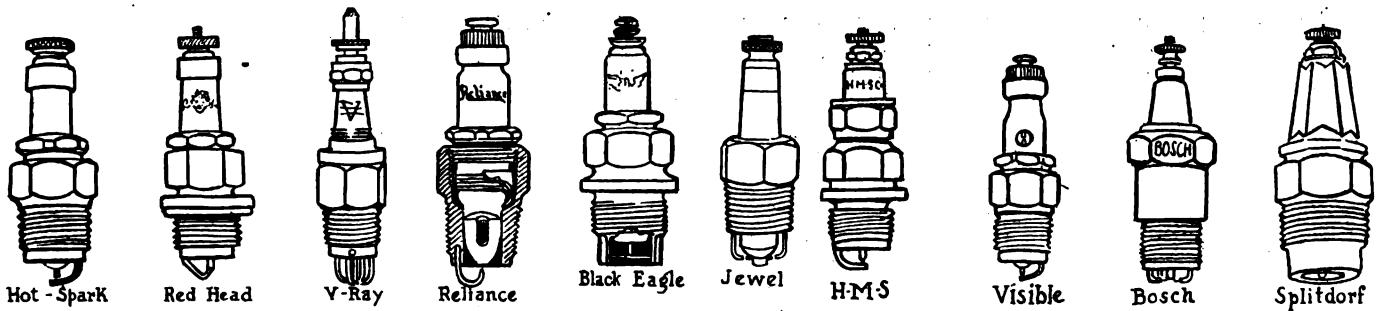
Duplex magnetos, exhibited by the Duplex Magneto and Spark Plug Co., serve a double purpose, as their name suggests. Which is to say that they are both high and low tension combined in one instrument, and by the use of a special plug either high or low tension ignition may be used at will, or both may be used at once. Though slightly foreign to the ignition subject, the apparatus exhibited by the Aristos Co. is sufficiently novel to warrant attention. It consists of a magnetic valve and a make and break mechanism which operate together serve to turn on the acetylene gas

to the head lamps and to light them at the same time. The complete operation is controlled by means of a small button on the dash.

Electric Lighting Systems.

It does not require the gift of second sight to discover that the trend toward electrical lighting of automobile cars is strong and growing stronger. If evidence were required, it would be found in abundance in the greatly increased number of electric lighting systems which are being disclosed at the show for the first time. A year ago the number of such systems could be counted on the fingers of one hand with a finger or two to spare. This year they are present in force. The ingenuity involved is particularly apparent in the different methods of regulation employed, as close regulation is necessary to assure the proper operation of an electric lighting outfit, both to maintain sufficient illumination when the motor is inoperative and to prevent damage to the lamps and generator at excessive engine speeds.

Most of the systems are for illuminating purposes only, but there are several which combine means for both illuminating and igniting. The Gray & Davis system, which was one of the first, is in the former category. Its general essentials are unchanged.

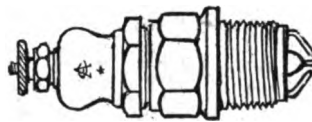


Its compound wound electric generator, in connection with a centrifugal governor, is utilized to keep the speed of the generator constant irrespective of the engine speed. An electric cut-out is employed to cut into the battery circuit when the car attains a speed of twelve miles an hour, and to cut out the battery when the speed diminishes to eight miles, which method under ordinary conditions will keep the battery fully charged and ready for use when required. The Esterline system in several types combines both ignition and illumination, the ignition unit consisting of a high tension magneto, which is combined with the lighting unit, the latter being of the permanent magnet type, eight large magnets composing the magnetic field in which revolves a drum armature of the slotted type. The controller performs several functions. It connects the battery to the generator when the voltage is high enough to begin charging and disconnects the battery when the electrical output of the generator is too low; also, it controls the current delivered to the batteries. The controller is located in a neat box on the dash with suitable switches for controlling the lights; it has no moving parts. The switch for lighting and extinguishing the lamps is located under the hood with a stem extending to the dash and is housed in a water and dust-proof case, the key of which is removable prevent tampering.

In the Deaco system, the development of the Detroit Electric Appliance Co., the current is produced by a strong magnetic field of permanent magnets together with the electro-magnetic field surrounding the permanent magnets, this auxiliary winding being used to regulate the output. A combined light and ignition outfit also is exhibited. The Delco system, which is the product of the Dayton Electric Engineering Co., is of the electrical relay governor

type of combined light and ignition system, and already is fairly well known. It is driven at engine speed with a direct drive from the motor. The Remy magneto light, which is exhibited in two models, is a combination outfit, consisting of a magneto dash coil, storage battery and small distribution plug. C. F. Splitdorf is another of the well-known ignition specialists who just has developed a combination light and ignition system. It is of the magneto electric type, having an automatic electrical governor to keep the battery properly charged.

The Rushmore lighting system, which



AC STAR

is displayed for the first time, is such that it is attracting the close attention of even electrical experts, as it is of the constant current type with inherent regulation, having only one movable part, i. e., the armature. The novelty and distinctiveness of the system lies in the regulation of the current output of the generator by the use of a so-called iron ballast coil, the iron wire having properties which greatly increase the resistance at a certain temperature just below red heat; below this point the resistance is constant. Employing this theory for regulation, the effect of the hot iron wire is to choke back the increase of current through excessive speed of the dynamo, thus tending to keep the output of the latter at a fixed point without attention on the part of the operator.

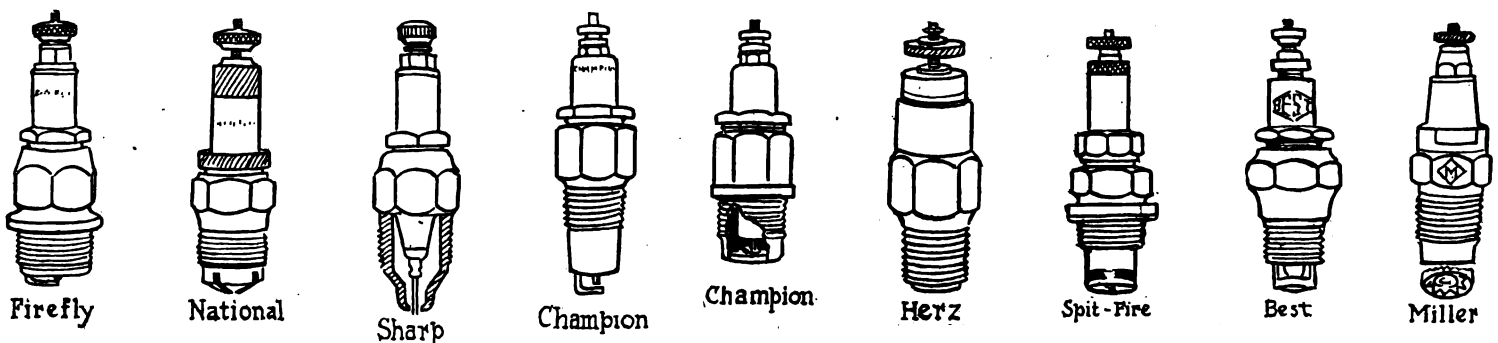
The Ward Leonard automatic dynamo system consists of dynamo and storage battery with a double relay for high and low

speed to control the output of the dynamo. The United States Light & Heat Co. exhibits a brand new lighting system which is driven direct from the motor. It employs a dynamo electric generator in conjunction with a controller which are the only two parts required in addition to the usual switch for controlling the lamps.

Spark Plugs.

Of spark plugs there is almost an infinite variety, but as the chief functions of such plugs is the firing of a gaseous mixture under the different working conditions that exist in automobile works, it was not to be expected that any considerable novelty would be found. There is little or no room for it. There are, however, several new plugs, among them the H. M. S., and the V-Ray. The former is notable as being the first plug marketed under its own name by the Hartford Machine Screw Co., of Hartford, Conn., an old and reputable concern which, after making the metal work for many spark plugs of many makers, finally has entered the market with a complete spark plug of its own; and it is fair to add that the plug is worthy of its source. It is not merely well designed but is splendidly made and represents one of the simplest forms of spark plugs. It consists of but three principal parts, shell, threaded collar and porcelain, with only one gasket for making the joint in the body, the seat being at the outer end of the latter; this construction reduces the strain on the porcelain insulator to a minimum and permits the spark plug, very rapidly, to be taken apart for cleaning purposes.

The V-Ray plug, which is shown in 12 different sizes and shapes by the New York V-Ray Sales Co., of New York City, is distinguished not merely by four converging electrodes, but by a V formation of the tips of each of them, which design tends to



JUST A FEW OF THE MANY TYPES OF SPARK PLUGS EXHIBITED

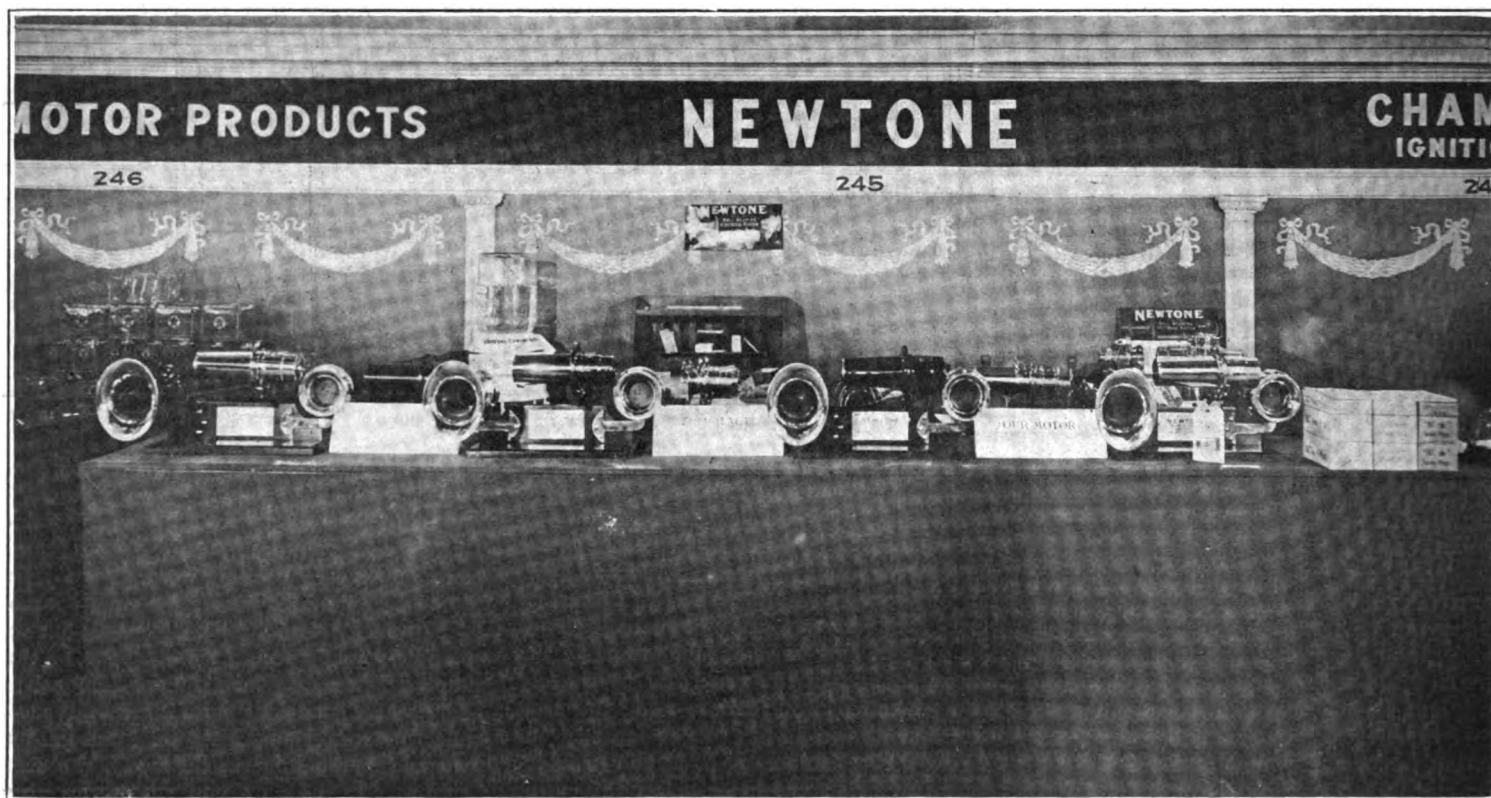
break up oil or carbon deposits on the points, and also to facilitate the passage of the spark between the electrodes. The Black Eagle plug, which is produced by the Progressive Mfg. Co., of Torrington, Conn., is another comparatively new comer, which shows the result of careful study and in which the loosening of any of the small parts is rendered practically impossible. The terminal rod is riveted to prevent turning and on the other end of the center rod is arranged the terminal which permits the use of all standard forms of clips without their working loose.

lator, instantly destroys any short-circuiting matter which may surround the sparking point. The Jeffery-De Witt exhibit also includes the Visible spark plug, which is to be marketed by the Visible Spark Plug Co., of Chicago, the feature of the new plug being a hole in the upper part of the porcelain electrode, which renders it possible to see the spark jumping between two points without removing it from the cylinder of the engine; in other words, the plug embodies a self-contained spark gap. The Champion Ignition Co., of Flint, Mich., also has increased its family of "AC" plugs, the

hibits what it styled the Miss-skip Detector, which is a little device which containing a tiny window protected by a glass tube and which when placed under the terminal end of the plug and the cable connected to the opposite end makes it possible to see the actual operation of sparking.

The Best plug, made by the Best Ignition Equipment Co., of New York, features a bushing which centralizes the porcelain electrode, giving direct pressure on the porcelain without twisting strain, and thereby preventing breakage of the porcelain. The sparking surfaces of this plug are of the

ONE OF THE EXAMPLES OF EFFECTIVE DISPLAY IN THE ACCESSORY DEPARTMENT



THE COMPREHENSIVE EXHIBIT OF NEWTONE HORNS IN THEIR VARIOUS SIZES AND SHAPES

Several of the older manufacturers have found it possible to make some minor improvements—all small in themselves but, nevertheless, contributing to a better appearance or a better general result. Of this number, the Jeffery-De Witt Co., of Detroit, shows not only its well-known Reliance and J-D plugs, but also a new one termed the Standard, which follows the lines of the Reliance type, but which has a dull black finish, and is sold at an attractive price. The feature of the Reliance is an insulated working point of hair-like platinum which is entirely protected by being baked in the center of the porcelain electrode and brought out flush with the end of it. When in action, the spark leaving this minute point is concentrated and intensified to such a degree that the heat and scouring action of the spark, being directed against the surface of the insu-

"AC Star" and the "AC Waterproof" having been added, to the "AC Standard," the two newer plugs representing a departure in spark plug design in that they are of three-piece porcelain construction, the assembly of the three pieces being such as to minimize breakage due to heat expansion or to vibration.

C. F. Splitdorf has refined his well-known product by improving the construction of the mica center piece, and by increasing the taper of the steel rod on which the sheet mica is rolled, which method is designed to render the plug absolutely gas-tight. An ornamental washer has been added to both the top and bottom of the outside insulator, thus enhancing the appearance of the plug.

The Champion Spark Plug Co., of Toledo, Ohio, displays its distinctive line of Champion plugs to good advantage and also ex-

flat or annular type, giving a large area for wear which assists in maintaining the electrodes the proper distance apart as the spark is occurring continually at different points of the circular button on the end of the porcelain electrode. Herz & Co., of New York, show their Bougie Mercedes with its double stone insulation enameled royal blue instead of in its former hue; the plug is characterized by a four point disk of platinum alloy, which is rolled into the lower part of the shell, and which serves the purpose of an oil deflector and multiple spark points. All of the other plugs familiar to the trade are shown without change of any sort—the Metzger Sootproof, The Bosch, The Jewel, The Miller, The Red-head and the Mosler Spitfire and Breech-block, the two latter now being supplied with pure platinum points at a slight additional charge.

ACCESSORIES

Signaling Devices.

While the good old bulb horn is far from being wholly displaced, that the electrically and mechanically operated signaling devices are in the ascendency, is evident to all who have eyes and ears. The Klaxon, which turned the tide in that direction, remains unimproved because improvement was impossible. The line has been increased, however, by the production of the Klaxonet combination horn, which is a small edition of the Klaxon and provides both an electrical blast and a bulb toot. For the first time, also, the Klaxon productions are being offered enameled in colors to match the cars on which they are to be used.

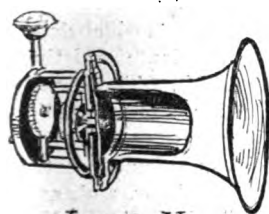
Another adaption of the Jericho Exhaust horn. The Typhoon, which is claimed the only motor driven horn operating by centrifugal force, remains unchanged in principle and in construction. The Sonora horn, which is produced by the New York company of that name, is the very newest of the warning signals. It is of the electric motor pattern but unlike others, the diaphragm has no button or stud riveted into the center. Being perfectly plain it acts like the head of a drum. The little spring member beats against the diaphragm or disk like a hammer, striking about 30,000 times to the minute, producing a deep toned whistle.

The Waymaker is another newcomer,

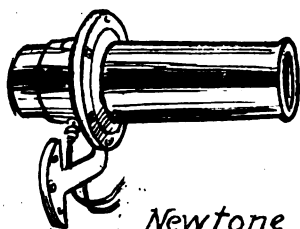
change. It is also of the vibrating diaphragm type. The Gray-Hawley Mfg. Co., however, presents not only its Autochime exhaust horn, without alteration, but an entirely new one of the same type, but of different design, which is styled the Auto-larm.

The G. Piel Co., of Long Island City, N. Y., continues its mechanically-operated Long horn without change and the fact that it is operated by a push button, and requires neither motor, battery, bulb nor wiring, keeps it in a "class apart" and serves to make it appeal strongly to the many.

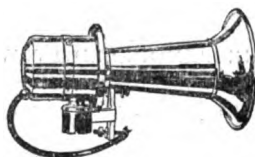
The United States Horn Co., and the Riley-Koltz Co., are the only exhibitors



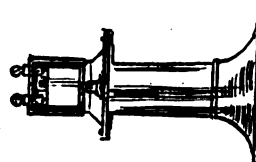
Long Horn



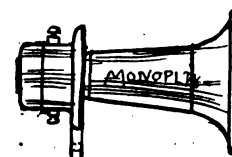
Newtone



Tuto



Sonora



Monoplex

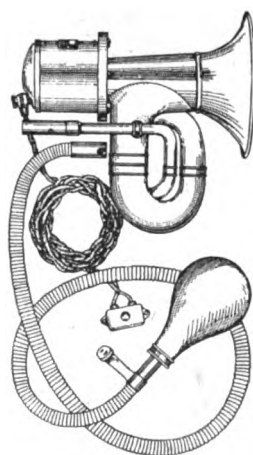
DIVERSITY IN THE EXHIBITS OF HORNS WITHOUT REEDS

The Auto Supply Mfg. Co., of Brooklyn, N. Y., which manufactures the Newtone, is featuring a motor comprising a field of 75 laminated pieces and giving what is claimed most efficient service at the least cost. By the adoption of a vanadium steel diaphragm a thirty-second of an inch thick, it is claimed that the consumption of electric current has been reduced 40 per cent. The Newtone makers have also developed a bracket which can be used on the right or left side of the dashboard, and is adjustable in all directions.

The Tuto horn, the product of the Dean Electric Co., of Elyria, Ohio, also has acquired a smaller brother, a Tutoette, both of which incorporate an improvement in the Tuto operating system, termed thumb control, which comprises a large push button of the sunken type arranged on the steering wheel so that the "danger signal" is always at instant command and without reaching for it. The Tuto horns are further distinguished by the fact that it is possible to regulate the volume of sound at the will of the operator simply by regulating the pressure on the push button.

There is now a little Gabriel, as well as a big Gabriel horn, the former being a recent addition to the line. It is merely a smaller reproduction of the well-known Gabriel "musical number" horn. In the same manner the Jubilee Jericho is a small-

produced by the Lee Tire & Rubber Co., Conshohocken, Pa. It is a combination exhaust and motor horn which is supplied with either hand or foot control, as desired.



COMBINATION KLAXONET

The Oneita electric horn, shown by the Mutual Auto Accessories Co. is still another newcomer of the vibrating electric type; it differs from others in that the vibrator is placed between the magnets and the diaphragm.

The Hipwell Autophone made by the Hipwell Mfg. Co. is presented without

who display bulb horns, and they display them in such a remarkable variety as to meet every possible want that may arise.

Lamps.

Owing to the present excellence of headlights and side lamps no radical improvements in either are on view, the few changes visible in the exhibits of the lamp manufacturers being in the nature of minor refinements or the bringing out of an additional style for some particular purpose. As has been the case in other shows the space occupied by the Badger Brass Mfg. Co., of Kenosha, Wis., is filled with the very best of oil, gas and electric lamps, which under the trade name Solar lamps are known the country over. Almost a score of new styles are brought out this year, including headlights, side lamps and tail lights, which needless to say, are quite up to the high standard set in former years. Several new models, including a "close-coupled" gas headlight, an electric side lamp with side glass and an electric tail lamp only 1 1/4 inches deep, fitted with a curved side glass are offered by Edmunds & Jones Mfg. Co., of Detroit, Mich., together with their well-known line of oil, gas and electric lamps. Old Sol lamps light the space of the Hawthorne Mfg. Co., of Bridgeport, Conn., while Rushmore headlights glitter in the booth of the Rush-

more Dynamo Works. In addition to showing their standard line of head, side and tail lights, Gray & Davis, of Amesbury, Mass., catch the eye of the visitor by a unique arrangement of their name in one of the large headlights. Using a small, ground glass bulb in this light, they painted the name Gray and Davis in black inverted letters on the ground glass, so that the name, greatly enlarged, is reflected from the parabolic mirror of the headlight and meets the eye of every passer-by.

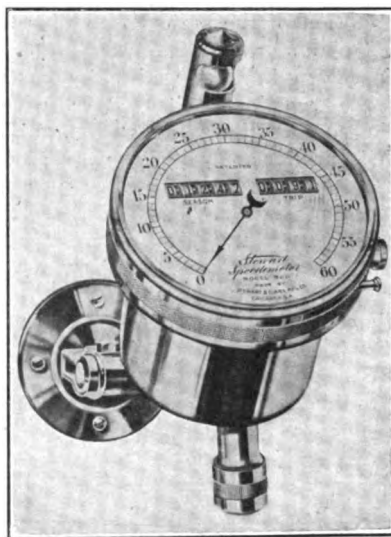
Speedometers.

While the makers of even such famous speedometers as the Stewart and the Jones have found room for improvement the only radical innovation is the New Troy pneumatic speedometer exhibited by the Troy Carriage Sunshade Co., of Troy, Ohio, which is a development of the pneumatic indicator produced by the same concern. In general appearance, so far as shape and dial are concerned, the New Troy suggests little out of the common. Its novelty lies in its operating mechanism. The pinion, driven from the sprocket attached to the front wheel, drives instead of a flexible shaft, a small four-vane rotary pump located on the front axle, which simply causes air to rotate from one cavity in the body of the pump to another and back again by means of a small orifice. The faster the vehicle travels, the faster the air is forced through this aperture, and the greater is the back pressure created, the latter being utilized to operate the dial hand through the medium of an oiled silk diaphragm and transmitting levers, gears, etc. The dial, although actually registering pressure per unit area, is graduated to read miles per hour, like the ordinary speedometer. The odometer is actuated by means of a vibrating diaphragm in the pump connected by means of a second tube to a thin kid diaphragm in the body of the speedometer. By means of the intervening air column, the motion of the pump diaphragm is communicated to the indicator diaphragm, and thence to the odometer by means of a simple lever. The Stewart speedometer, to quote the Stewart & Clark Mfg. Co., is new from road wheel gear to pointer.

It embodies a new odometer, direct drive, stop movement. The figures are on celluloid cylinders affixed to bronze gears. With this construction it is impossible for the dials to move out of position or indicate other than the absolute mileage. There are no springs in the make-up of this odometer. The use of this odometer somewhat changes the design of the dial. In place of small, separate openings for each figure as heretofore, there will be one large opening for the season mileage and one opening for the trip. The season mileage register will indicate 100,000 miles, the trip register 100 miles, and can be set to any tenth of a mile.

Another feature is the use of an alloy metal in place of the aluminum heretofore

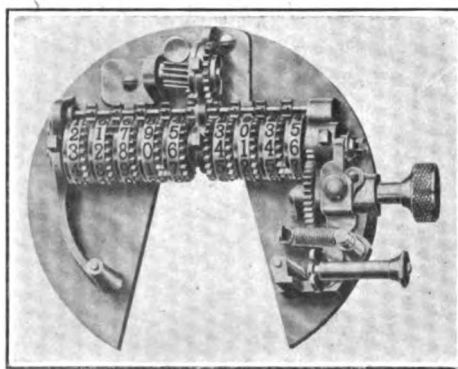
used in the indicating disk. This alloy is unaffected by temperature changes. Still another feature is the regulator, which will permit the speedometer to be regulated like a watch. The shaft carrying the pointer is now constructed with a shoulder at the upper end. The upper jewel bearing sets down against this shoulder. This causes



THE REMODELED STEWART

the hand to be very steady and prevents vibration.

There is a new type of flexible shaft, practically unbreakable, made up of three-quarter round spring wire, a flat surface making the inner wall of the shaft. This core is covered with brass triangular shaped wire which is forced into the interstices of the inner wall. This makes a flat outside to the shaft, and a very handsome appearance. The chain will be the same as always used. The links hook one into the other—the most durable chain that



STEWART ODOMETER MECHANISM

has ever been produced for flexible shaft use.

Perhaps the most important feature of all is the drop forged swivel joint in place of a cast joint, as used heretofore, the drop forging being designed to give service that will outwear the car. There is a new type of steering arm clamp, the swivel block permitting the arm carrying the swivel joint to be always in a horizontal position. This clamp is adaptable to 90 per cent. of

the cars in use. The road wheel gears are of heavy malleable steel, with a broad-faced involute tooth, milled, not cast, which in connection with the fiber pinion will insure quiet running and long service.

The clock combinations will also comprise a new feature. The clocks used during the past two years have been rim wind, doing away entirely with the need of a key, as a few turns of the rim wind the clock. This feature has been improved to the point where the clock can now be set by means of this same rim. By pulling out on the rim and turning it, the hands will move to any position required.

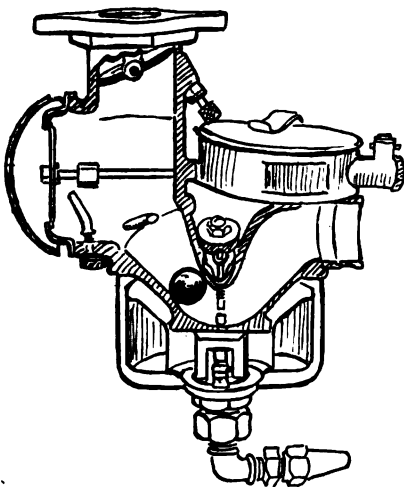
The Jones speedometer, which is of the centrifugal type, has been bettered by the addition of a second governor which is more sensitive than the main ring governor which takes care of the slow speeds. The new governor becomes operative after the car exceeds a speed of fifteen miles per hour. The Jones also has been provided with a reset for the odometer trip scale which makes it possible to change the record at will. The reading dial of the odometer also has been increased in size, and a ball bearing, bevel gear, swivel drive has been adopted to eliminate twisting strain on the flexible shaft. The Jones manufactures have been increased, first, by the addition of a hub odometer which is incorporated in a special hub cap to match the hub caps of any make of car, and, second, by a hand "edition" of the Jones live map, in which the map is revolved in a pressed steel waterproof case by turning a center thumb screw, the indications on the map being exactly the same as on the machine-driven type. The only other device of the latter sort is the Chadwick safety road guide which is displayed by the Bantam Anti-Friction Co., of Bantam, Conn., which somewhat resembles the Jones invention, but which is provided with a set of perforating punches and actuating keys permitting the tourist to make his own records.

The Warner Autometer, which, because of its shape will always remain distinctive, is continued practically without change so far as its mechanism is concerned. It remains of the magnetic type, of course, but has been improved to the extent that it is now provided with a new driving mechanism which consists of a swivel bracket provided with spiral gears and a self-cleaning pinion. The odometer feature of the Warner instrument also has been provided with a reset permitting instant change of the trip record to any reading the user may desire. The Star speedometer, made by the Milton, Pa., company of that name, is also a centrifugal governor type and differs from the others in that the governor revolves at a greater rate of speed to insure correct registration of low car speeds. The odometer is of the star wheel pawl type, provided with a reset of the trip scale. A swivel of compact construction takes the movement of the steering wheel from the flexible shaft.

The Standard speedometer made by the Standard Thermometer Co., of Boston, in which the steadiness of the indicating hand is the feature, is continued without change. The same is true of the Veeder tachometer, which is of the liquid-centrifugal type, a column of red liquid indicating the speeds. The Veeder hub odometer, which was the first of the sort, remains unaltered.

Carburetors.

Four new carburetors, the Excelsior, Diezemann, G & A and New Miller are displayed for the first time, and each discloses notable ingenuity. So far as the older carburetors are concerned, the chief tendency is made clear in the case of the Stromberg and the Schebler in the form of



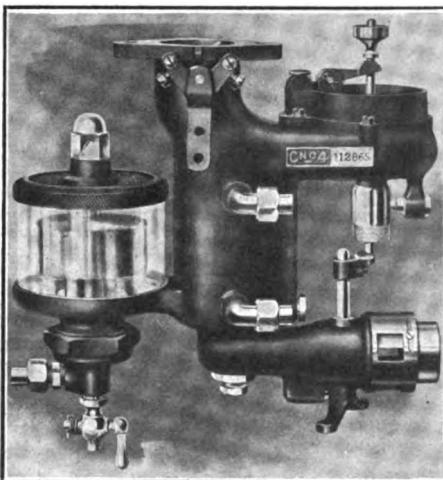
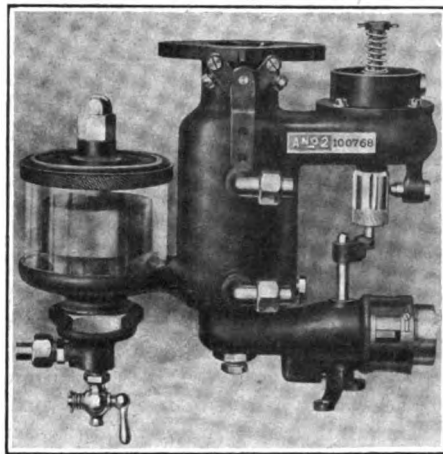
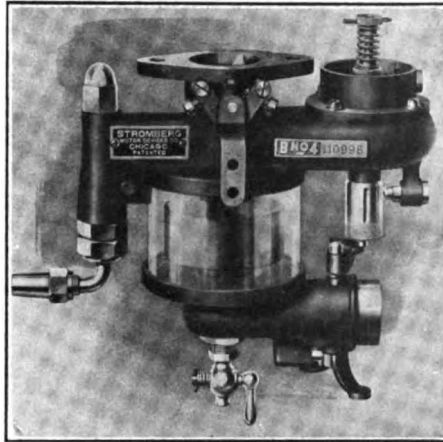
THE EXCELSIOR CARBURETOR

provision for dashboard control, a convenience which is not to be minimized. The Rayfield already was so arranged and in the case of the Schebler dash control of the auxiliary inlet valve is the only refinement that has been expected.

In the case of the Stromberg, similar provision has been made, but the refinement goes further and, to a certain extent, changes the appearance of the several patterns of that well-known instrument. The underlying principle, the venturi tube and single jet, are, of course, retained, but there has been incorporated a hot air horn for the admission of heated air from a jacket around the exhaust manifold. What is styled a starting device is also a Stromberg feature. It is essentially a primer consisting of a bell crank, one arm of which is used as a cam to hold the auxiliary inlet valve stem and prevent the opening of the valve, thus requiring all the air to be passed through the venturi tube, and providing a rich mixture for starting. The Flechter Locomotive-type of carburetor, so-called by L. V. Flechter & Co., of New York, because the designation suggests speed and power, and which is of the single jet venturi type, has been improved to the extent that a water jacket drain, a two point snap cock gasoline drain, a cylindrical strainer on the fuel inlet, have been provided and

the length of the auxiliary air valve stem and bearing increased.

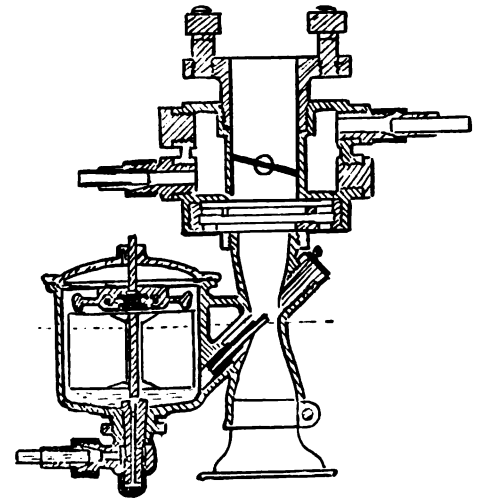
The Excelsior, made by the Excelsior Needle Co., of Torrington, is a venturi tube single jet type carburetor, differing from others in that the needle valve adjustment for the control of the gasoline is set by a



LATEST STROMBERG CARBURETTERS

mathematically figured rule, not by guess work. The needle valve which controls the gasoline passing through the jet, is equipped with a milled nut for adjusting. Upon the nut is placed a series of arbitrary numbers, the opening of the jet being proportioned to the cylinder bore, each num-

ber on the nut corresponding with a certain size bore. Other features claimed for the device by the makers are absolute automatic control of the mixture under all conditions of speed, and facility of adjustment. The former is secured by the combined actions of a movable ball resting in one side of the venturi behind the jet, and a perfectly tempered flat spiral spring governing the auxiliary air intake. A bar stop holds the ball so that at low speeds only a small crescent shaped opening in the tube is available, the reduced velocity of the air passing over the jet tending to decrease the amount of gasoline drawn up and vaporized. As the speed is increased, the ball is drawn, or rather pushed, by reason of the reduced air pres-



G & A CARBURETOR IN SECTION

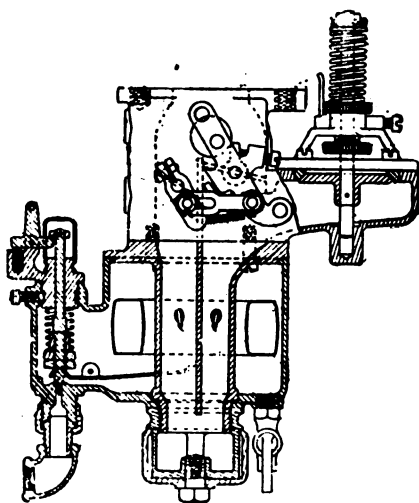
sure before it, farther up into the tapered tube, increasing as it moves, the area around the ball allowing of greater air velocity and richer mixture. The ball is prevented from entering the mixing chamber by a second stop in the head of the venturi. The spring governing the movements of the auxiliary air inlet valve is housed in a dustproof case, through which a shaft provided with a milled nut passes, for changing the tension of the spring, which operates through the medium of a series of gear wheels, on the valve spindle.

Claiming that the double nozzle, double throttle control principle incorporated in their product will give an absolutely constant quality of mixture at all engine speeds, the Stevens Mfg. Co., of Rome, N. Y., is exhibiting the Diezemann Two-in-One-Carburetor at the stand of the Pitt Coil Co.

The instrument is distinguished by two inclined jets placed one in each half of a split venturi tube which leads up through the float chamber, the jets being so arranged with regard to the center of the float chamber that it is impossible to vary the level in the jets when ascending hills or rounding corners at high speed. The throttles are connected by means of a slotted link, allowing a certain amount of lost motion to give the first throttle a chance to fully open before the second

throttle begins to open. By means of an auxiliary air inlet valve the mixture is kept constant after the first throttle is fully opened, but before the second throttle has started. When the second throttle starts to open, the valve becomes inoperative until the motor reaches maximum speed. A dashboard control is attached to the needle valve in the first mixing chamber, starting being facilitated by opening this jet and at the same time holding closed the auxiliary air inlet valve by means of a cam engaging with the valve stem, also operated from the dash.

The G & A carburetter operates on the venturi tube, single jet principle, but is novel in respect to its control of the admission of auxiliary air, and also because of the entire absence of springs; also it is claimed to be adjustmentless. The auxiliary air inlet valve, which really is a com-



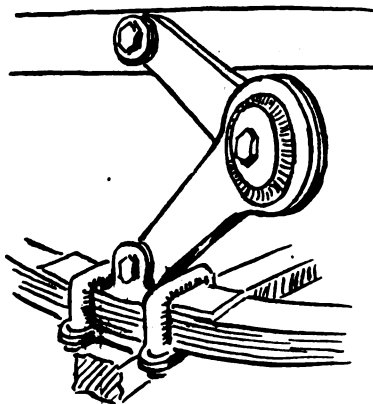
INTERNALS OF DIEZMANN CARBURETTER

posite series of smaller valves, is placed concentric with the venturi tube, the air being admitted through a series of holes of graduating sizes. Seating in these holes are bell bronze balls of varying diameters and weights, carefully proportioned to lift as the engine speed increases and more air is required, successively and progressively insuring the maintenance of a mixture of constant quality at all engine speeds.

The New Miller, which is of California origin, is a single jet venturi tube carburetter, the jet, however, being controlled by a plunger needle held open by a spring. The auxiliary air inlet is opened by revolving a sleeve with an inclined slot through which passes a pin fastened to the body of the carburetter. Revolving the sleeve causes it to lift, thus uncovering the auxiliary air ports. The mixture is kept constant by means of a flexible spring steel cam operated in conjunction with the throttle, a roller fixed to a lever resting on top of the needle valve plunger. As the butterfly valve is opened the lever is raised, thus supplying more gasoline at high speeds. The roller can be shifted to operate on different parts of the cam, and the cam can be regulated to provide different degrees of throw

by means of screws. The dashboard control operates directly upon the needle valve opening the jet through the medium of a cam to increase the proportion of gasoline in the mixture for starting.

Devices having for their object the thorough mixture of the vaporized gasoline and air which together form the explosive mixture that gives life to the motor have been made in various forms for years, but with-



MONDEX SHOCK PREVENTER

in the last two years more and better "mixers" have been placed on the market than ever before. One of the latest is the "Speedo," handled by the Motor Car Equipment Co., of New York City. Its modus operandi is the injection into the intake manifold of small jets of air through a perforated nozzle, which thus acts as an auxiliary air valve. The volume of air admitted is controlled by a poppet valve actuated by the suction of the engine, increased engine speed causing a larger opening and an increase in the quantity of air. A priming cup permits the introduction into the manifold of gasoline for starting, or kerosene for decarbonizing purposes. The "Speedo" is screwed into a 1/4 inch hole drilled in the manifold and tapped. The more familiar type of mixer, having a small suction-operated fan wheel which all the mixture must pass on its way to the cylinders, is represented by the Royal Equipment Co.'s Gyrex, which has been in successful use for several years. Band brakes and Raybestos brake lining also form a part of the Royal exhibit.

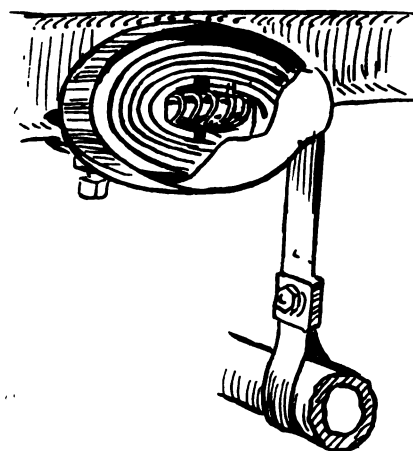
Shock Absorbing Devices.

One really novel shock-absorbing device is in evidence—the Gabriel Rebound Snubber, made by the Gabriel Horn Mfg. Co., of Cleveland, Ohio, and so called because its action is not unlike that of snubbing a boat. The Gabriel "snubber" is simply a spiral coil of Balata belting around a compressible spring pad of oval shape. The free end of the belting is attached to the axle of the car. The axle is free when the car springs are depressed, but in the rebound the coils of belting grip around the compressible pad on the frame, "snubbing" the upward movement so that the rebound is neutralized beyond the normal position of the springs.

The Mondex shock absorber, while apparently new, is new in name only, having been marketed under another name several years since. It is of conventional design. The J. M. shock absorber which is merely a compactly enclosed supplementary spring, also is displayed for the first time. And it goes without saying that such old stand-bys as the Truffault-Hartford, the Connecticut, the Flentje, not to mention the Weston absorber, or the Sayer supplementary springs, are as always, very much in evidence.

Automobile Components.

Of the very many things which enter into the actual makeup of automobiles—the motors, the transmissions, the springs, the axles, etc., etc., there is little that is novel, and nothing that is radical, excepting only the Sphinx slide valve motor, the



GABRIEL REBOUND SNUBBER

Mead rotary valve engine, both of which recently have been much illustrated and described, and the astonishing Broc motor, the latter of which is shown by F. T. McGinnis, and which appears to be at the same time both a rotary and a slide valve type.

In the matter of transmissions there is one other development—that of the Merchant & Evans Co., of Philadelphia, Pa., which has brought out a type in which direct drive is attained on both second and high speeds, this very desirable effect being attained by the use of a double bevel driving member on the jack shaft. For second speed the bevel pinion in mesh with the larger gear is locked by means of a pinion engaging in an internal recess in the bevel pinion. To secure the high speed ratio the pinion is slid along the squared shaft entering a recess in the bevel pinion on the smaller driving bevel.

The Covert Motor Vehicle Co., of Lockport, N. Y., exhibit a very complete line of transmissions designed to be incorporated with the rear axle or jack shaft construction. The transmissions are designed with an especial view of facilitating accessibility, are equipped throughout with Hyatt high duty type roller bearings, special provision being made for adjustment.

Compactness in transmission design is made a feature with the Lefever Arms Co., of Syracuse, N. Y. Into a glass case approximately 7 x 7 inches are placed all the working members of a three-speed forward and one reverse type of transmission, capable of transmitting up to 30-horsepower. There also is a Covert, the planetary transmission made to be interchangeable with the selective type.

Designed especially for use with cars having center control, the type MXT transmission, made by the Buda Co., of Chicago, Ill., has the gear shift lever mounted on the case cover, the shape and the method of mounting being distinctive. The lever is shaped like a cane with a plain ball handle, and is operated through a ball and socket joint, permitting free movement, through the top of the case, the lower end engaging with the gear shifting saddles.

No marked changes have been made in axle design, neither front nor rear. The chief exhibitors are the Timken-Detroit Axle Co., the Sheldon Axle Co., of Wilkes-Barre, Pa.; A. O. Smith Co., Milwaukee, Wis.; Weston-Mott Co., Flint, Mich.; the American Ball Bearing Co., Cleveland, Ohio; The McCue Co., Buffalo, N. Y.; Driggs-Seabury Ordnance Co., Sharon, Pa.; Hess Spring and Axle Co., Carthage, Ohio, and the Stutz Auto Parts Co., of Indianapolis, Ind.

New ideas in the ball bearing trade, excepting only in the design of ball retainers, are few and far between. Ball bearings designed to compensate for untrue shafts are displayed by the S. K. F. Ball Bearing Co., of New York, and the Rhineland Machine Works Co., also of New York. Radical type bearings with ring retainers are exhibited by the Bantam Auto-friction Co., Bantam, Conn.; Hess-Bright Manufacturing Co., Philadelphia, Pa.; Barthel, Daly & Miller, New York City, who display Schafer ball bearings; Marburg Bros., Inc., New York, who display S. R. O. products; the R. I. V. Co., of New York City; the Imperial Bearing Co., of Detroit, Mich., and the New Departure Mfg. Co., of Bristol, Conn.

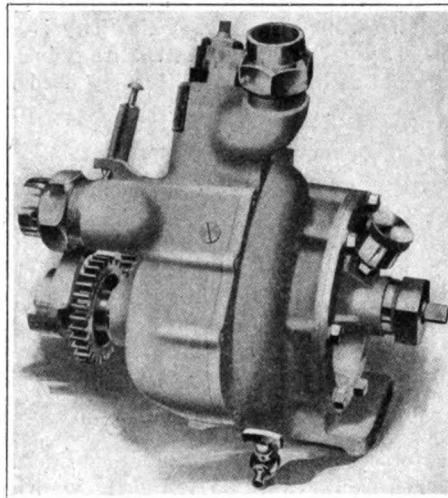
Roller bearings are exhibited by the Timken Roller Bearing Co., of Canton, O.; Standard Roller Bearing Co., Philadelphia, Pa.; Bower Roller Bearing Co., Detroit, Mich., and the Hyatt Roller Bearing Co., Newark, N. J., all of them well made and thoroughly standardized productions.

There are motors and transmissions, and levers and gears, shown by the Warner Gear Co., of Muncie, Ind., by the Muncie Gear Works, of the same place, and by T. W. Warner, of Toledo, O. There is one exhibit of steering gears exclusively—that of the Zemmer Mfg. Co., but steering gears are also a part of the many productions of the Jackson-Church-Wilcox Co., of Saginaw, Mich., just as frames and axles are but a few of the many things made by the big A. O. Smith Co., of Milwaukee. The

Standard Welding Co., of Cleveland, is another notable exhibitor of parts—electrically welded parts exclusively.

Ingenious Pump a Real Novelty.

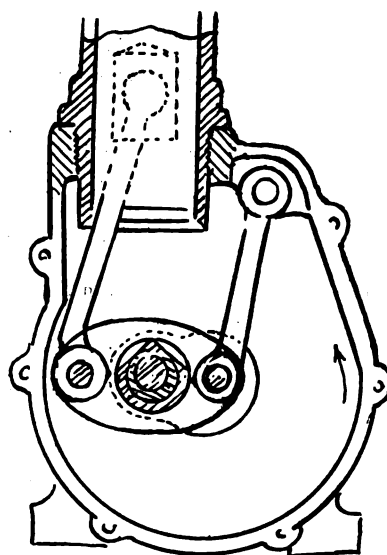
Though not all the numerous accessories that the show reveals rightly may be termed new, there is at least one entitled to



"H. M. S." AIR AND WATER PUMP

the designation—the ingenious little air compressing pump that is exhibited by the Hartford Machine Screw Co., of Hartford, Conn., and though it operates on the old and well-known plunger and cylinder principle, modifications of a radical nature, claimed incidentally to increase its efficiency materially, make it of genuine interest.

As may be seen in the accompanying illus-



"H. M. S." PUMP IN DETAIL

tration, the pump consists essentially of a working cylinder and an abnormally long piston. As a matter of fact the piston is made longer than usual and is carefully ground to fit for the express purpose of obviating the necessity for packing, which is conspicuous by its absence. It is in the

method of connecting the piston to the miniature crankshaft that the real novelty of the device is displayed. In the first place, the cylinder is considerably offset and instead of the connecting rod being connected directly to the crankshaft it is connected to a toggle mechanism which in turn is fastened to the crankshaft. The object of this novel method of "hook up," it is apparent, is to obtain a piston stroke which is double that obtainable for a given throw of the crankshaft when the piston is connected in the ordinary way. Simple, flat disk valves located in the cylinder head, where they are in a position to be cooled by the inrushing air, are employed, and the obtainable pressure is 200 pounds to the square inch. It employs an aluminum casing and other parts of bronze and fine gray iron; the pump is unusually compact and weighs but 6½ pounds. It is made in two styles, as a plain air compressor, in which case it is driven through gearing in the most suitable place on the engine, and also as a combination air compressor and water pump. The combination pump is exceptionally compact, a unit housing serving for both water and air pumps. Obviously, this feature permits the air pump to be water cooled, though it is said that this scarcely is necessary. Neither of the air pumps need be left running except when in actual use, a small lever serving to connect or disconnect them at the will of the operator.

Metals, Castings, etc.

"Non-corrosive silver" is the feature of the exhibit of the Vanadium Metals Co., of Pittsburgh, Pa., and a large assortment of levers, boxes, handles, and other implements made of this new alloy covers the stand. The alloy consists of aluminum, tin, nickel and vanadium, looks similar to silver and is said to be impervious to atmospheric influence, or the action of weak acids, alkalis and salt. Intermingled with the "silver" are several pieces of polished aluminum-vanadium made into exact duplicates of the heavy silver articles, and the surprised expression of the casual visitor picking up a piece at random here and there and finding one as heavy as steel, and the other as light as aluminum, but indistinguishable by visual examination, is interesting to watch. Bronze gears of high finish and bronze metal cast in all manner of shapes form the exhibit of the William Cramp & Sons Ship and Engine Building Co., while the General Electric Co., of Schenectady, N. Y., shows a series of cloth pinions—to the great mystification of the average visitor. The pinions are made according to a process similar to that of manufacturing rawhide pinions, the cloth sheets being saturated with a binder substance and subjected to great pressure. Steel sheets are then placed above and below the block of compressed cloth and the pinion is cut out with a die. The makers claim that a cloth pinion of the type shown

will outwear and outwork an ordinary cast iron pinion, while offering the great advantage of comparative silence in meshing and a great reduction in weight.

Non-Gran bearing bronze in cored bars for bushings is the special appeal which the American Bronze Co., of Berwyn, Pa., makes to the garage owner. The bars are put up in ten different sizes and are ready for the lathe.

Vanadium steel springs are shown by the Carnegie Steel Co., of Pittsburgh, Pa., in the grip of a powerful testing machine which grips the center of the spring and pulls it down a distance of about twelve inches, immediately after it forces the spring six to eight inches in the other direction. So strenuous was this testing carried on that on the opening night one of the springs placed in the machine snapped in twain with a loud report.

Iron, steel and copper seamless tubing is shown on many stands, the most prominent being those of the National Tube Co., Pittsburgh, Pa.; Peter A. Frasse & Co., New York City; Standard Welding Co., Cleveland, Ohio; and George Nash Co., New York City. The exhibit of Peter Frasse also contains an assortment of imported steels from Austria (Poldi steels) and samples of fractures of steel and poor annealing.

The desire for "silent" motors, which is so apparent at present, has served to bring to the front the so-called "silent" chain, one of which is shown for the first

time by the Whitney Mfg. Co. Two other makers also show this type of driving chain—one of them, the Link-Belt Co., offering its "Maximum" chain, while in the exhibit of Peter A. Frasse, several new types of the Renold silent chain are shown.

Believing that piston rings should be made concentric rather than eccentric, the Wasson Piston Ring Co., of Bayonne, N. J., exhibits rings that are of uniform cross section throughout. Great elasticity is obtained by peen-hammering the rings inside, a special automatic machine being used for this purpose.

Supplies in General.

Tool kits, tools and "handy machinery" of all sorts and shapes may be found at the booth of J. H. Williams, whose ratchetless ratchet wrench—now styled "ratcho"—created quite a talk at the last show, and at the stand of Frank Mossberg who has a number of novel devices on view. One of these is an adjustable pipe wrench in which the lower jaw is swiveled, while another is of the so-called alligator type in which one of the jaws is a straight continuation of the handle and carries a screw driver at the top. The company makes a specialty of advertising devices, one of the oddest being a vest-pocket corkscrew, made with "left-hand drive." New styles of belt couplings for motorcycle tires, belts and reels form the remainder of the interesting exhibit.

It is, however, when the show investi-

gator reaches the exhibits of such supply houses as Charles E. Miller, that he becomes bewildered, for they are miniature accessory shows in themselves. Among the multitude of accessories shown in his booth several novelties are especially worthy of mention. One of these is the Invincible tire tester, made by the United States Gauge Co., and described in another column; another is his Pan-American Tire Saver, which is a repair outfit for tires without requiring vulcanization. Brampton chains occupy a conspicuous place in the booth, while all around are Pan-American oils, polishes and varnishes manufactured by him. He also shows a new woven wire tire pumping tube for garage use which is strong enough to withstand the weight of an automobile running over it, and which is supplied as long as 100 feet or more. The New York Sporting Goods Co. is another display that overflows with accessories of all sorts.

Fluid and non-fluid oils, graphites and greases, not to mention Valentine's rainbow colored varnishes and paints, attracted their full quota of attention, especially the moving exhibits of the Joseph Dixon Crucible Co., International Acheson Graphite Co., and Harris Oil Co. Soaps, polishes, grease guns and oil pumps were spread out on the stands of many makers, the soaps and pastes marketed under fanciful names ranging from "Tisafine" to "Klean-easy," and in colors ranging from gray to green and even blue.

The 329 Accessory Exhibits at the Garden and What They Display

Ajax-Grieb Rubber Co., New York City—Ajax tires.

Ajax Trunk and Sample Case Co., New York City—Tire trunks.

Allen Auto Specialty Co., New York City Supplies.

Alexander Mfg. Co., J., New York City—Tire covers, tire gauges, tire locks and holders.

American Ball Bearing Co., Cleveland, Ohio—American ball bearings and axles.

American Bronze Co., Berwyn, Pa.—Bronze castings.

American Circular Loom Co., Aldene, N. J.—No-Lag Magnetos.

American Oil Pump and Tank Co., Dayton, Ohio—Lubricating devices.

American Rim Co., New York City—Lambert demountable rims.

American Taximeter Co., New York City—Taximeters.

American Vanadium Co., Pittsburgh, Pa.—Vanadium steel castings.

The Anglada Co., New York City—Anglada demountable rims.

Aristo Co., New York City—Mondex shock absorbers, Disco self-starters and Fray lighting system.

Ashley, James R. & Co., New York City—Portable garages.

Atlas Chain Co., Brooklyn, N. Y.—Non-skid tire chains.

Atwater Kent Mfg. Works, Philadelphia, Pa.—Uni-Sparker, ignition apparatus and Monoplex horns.

Auburn Auto Pump Co., Auburn, N. Y.—Tire pumps and pneumatic jacks.

Automobile Journal Pub. Co., Pawtucket, R. I.—Publications.

Auto Specialty Co., Toledo, Ohio—Specialties.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone horns.

Auto Wind Shield Co., Cambridge, Mass.—Windshields.

A-Z Co., The, New York City—Radiators, hoods, mudguards, metal hampers.

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps and generators.

Baker & Co., F. A., New York City—Motorcycle supplies.

Baldwin Chain and Mfg. Co., Worcester, Mass.—Baldwin chains, recoil checks and Brown steering gears.

Bantam Anti-Friction Co., Bantam, Conn.—Hangers, bearings and road guides.

Barker, C. B. & Co., Ltd., New York City—Excelsior carburettors and Black Eagle spark plugs.

Barthel, Daly & Miller, New York City—Schafer ball bearings.

Batavia Rubber Co., Batavia, N. Y.—Batavia tires.

Baum's Castorine Co., Rome, N. Y.—Lubricants, polishes.

Benford Mfg. Co., Mt. Vernon, N. Y.—Spark plugs and timers.

Best Ignition Equipment Co., New York City—Best spark plugs.

Blackledge Mfg. Co., John W., Chicago, Ill.—Auxiliary springs.

Booth Demountable Rim Co., Cleveland, Ohio—Booth demountable rims.

Bosch Magneto Co., New York City—Bosch magnetos and spark plugs.

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.

Bowser & Co., S. F., Inc., Fort Wayne, Ind.—Bowser gasoline and oil storage apparatus.

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos.

Briggs & Stratton Co., Milwaukee, Wis.—B. & S. igniters and magnetos.

Briscoe Mfg. Co., Detroit, Mich.—Radiators, hoods and fittings.

Brown Co., Syracuse, N. Y.—Brown tire pressure testers, pumps, lamp lighters, tire tools.

Brown-Lipe Gear Co., Syracuse, N. Y.—Transmissions, differentials and steering gears.

- Buda Co., Harvey, Ill.—Motors, gears, forgings, jacks.
- Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburettors.
- Calmon Asbestos & Rubber Works, New York City—Packing and brake linings, gears and springs.
- Carnegie Steel Co., Pittsburgh, Pa.—Axles, gears, springs.
- Carr Co., F. S., Boston, Mass.—Automobile coverings.
- Champion Ignition Co., Flint, Mich.—Coils, timers, spark plugs.
- Chandler Co., Springfield, Mass.—Nameplates and monograms.
- Chilton Co., Philadelphia, Pa.—Publications.
- Christian Bros. Co., Brooklyn, N. Y.—Solder and polishes.
- Class Journal Co., New York City—Publications.
- Clucker & Hickson Co., New York City—Lamps and tire casings.
- C. M. B. Wrench Co., Syracuse, N. Y.—Silver King socket wrenches and Hipwell horns.
- Coes Wrench Co., Worcester, Mass.—Wrenches.
- Columbia Lubricants Co., New York City—Monogram oils and greases.
- Columbia Nut & Bolt Co., Bridgeport, Conn.—Lock nuts and bolts.
- Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, spark coils, switches, and other ignition specialties.
- Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.
- Continental Rubber Works, Erie, Pa.—Tires.
- Cook's Sons, Adam, New York City—Lubricants.
- Covert Motor Vehicle Co., Lockport, N. Y.—Change gear mechanisms.
- Cowles & Co., C., New Haven, Conn.—Forgings, mountings and trimmings.
- Cox Brass Mfg. Co., Albany, N. Y.—Brass automobile accessories.
- Cramp & Sons Ship and E. B. Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.
- Cross & Co., C. J., New York City—Dayton airless tires.
- Crucible Steel Co., of America, Pittsburgh, Pa.—Crucible steel castings.
- Daniels, Smalley, Boston, Mass.—Supplies.
- Dayton Engineering Laboratories Co., Dayton, Ohio—Deleo ignition apparatus, lighting and starting dynamos.
- Dean Electric Co., Elyria, Ohio—Tuto horns and Dynalux lighting systems.
- Detroit Electric Appliance Co., Detroit, Mich.—Electric lighting apparatus and engine starters.
- Detroit Lubricator Co., Detroit, Mich.—Detroit lubricators.
- Diamond Chain & Mfg. Co., Indianapolis, Ind.—Chains and sprockets.
- Diamond Rubber Co., Akron, Ohio—Diamond tires.
- Dixon Crucible Co., Joseph, Jersey City, N. J.—Graphite lubricants.
- Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.
- Donnelly Motor Equipment Co., New York City—Supplies.
- Dorian Remountable Rim Co., New York City—Dorian remountable rims.
- Dover Stamping & Mfg. Co., Cambridge, Mass.—Drip pans and funnels.
- Double-Fabric Tire Co., Auburn, Ind.—Tires, inner tubes and patches.
- Driggs-Seabury Ordnance Corp., Sharon, Pa.—Frames, crank shafts, etc.
- Duplex Magneto & Spark Plug Co., Brooklyn, N. Y.—Duplex Magnetos and spark plugs.
- Dykes Co., John L. G., Chicago, Ill.—Tire protectors.
- Eagle Co., Newark, N. J.—Windshields.
- Eavenson & Sons, Inc., J., Camden, N. J.—Soaps and polishes.
- Edison Storage Battery Co., West Orange, N. J.—Storage batteries.
- Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.
- Eisemann Magneto Co., New York City—Eisemann magnetos.
- El Arco Radiator Co., New York City—Radiators.
- Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.
- Elliott, H. A., Detroit, Mich.—Forgings.
- Empire Tire Co., Trenton, N. J.—Empire tires and brake linings.
- Endurance Tire & Rubber Co., New York City—Tires and inner tubes.
- English & Mersick Co., New Haven, Conn.—Metal trimmings.
- Essex Rubber Co., Inc., Trenton, N. J.—Covers, patches, and re-liners.
- Esterline Co., Lafayette, Ind.—Matchless electric lighting and ignition system.
- E. Z. Way Motor Grease Co., New York City—Oils and greases.
- Fedders Mfg. Co., Buffalo, N. Y.—Radiators and tanks.
- Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.
- Findelsen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburettors.
- Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires and rims.
- Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires and rims.
- Fletcher & Co., L. V., New York City—"Locomotive type" carburettors.
- Flentje, Ernst, Cambridge, Mass.—Hydraulic recoil preventer.
- Franklin Mfg. Co., H. H., Syracuse, N. Y.—Dies and castings.
- Frasse & Co., Peter A., New York City—Tubing and tools.
- G & A Carburetter Co., New York City—G & A carburettors.
- Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel exhaust horns and rebound snubbers.
- Garage Equipment Mfg. Co., Milwaukee, Wis.—Gem spark plug wrench and supplies.
- Gardner Engine Starter Co., Chicago, Ill.—Gardner engine starter.
- Geiszler Bros. Storage Battery Co., New York City—Storage batteries.
- Gemmer Mfg. Co., Detroit, Mich.—Steering gears and parts.
- General Electric Co., Schenectady, N. Y.—Cloth pinions.
- Gibney & Bro., James L., Philadelphia, Pa.—Gibney solid tires and electric vulcanizers.
- Gilbert Mfg. Co., New Haven, Conn.—Tire covers, magneto covers, leggings, etc.
- Gilmer, M. S., New York City.
- Globe Machine & Stamping Co., Cleveland, Ohio—Steel boxes for tools.
- Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
- Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.
- Gould Storage Battery Co., New York City—Storage batteries.
- Gray & Davis, Amesbury, Mass.—Lamps and lighting dynamos.
- Gray-Hawley Mfg. Co., Detroit, Mich.—Exhaust horns and mufflers.
- Gray Specialty Co., Newark, N. J.—Specialties.
- Grossman Co., Emil, New York City—Red Head spark plugs.
- Hall-Thompson Co., Hartford, Conn.—Oils, greases and polishes.
- Hardman Tire & Rubber Co., New York City—Hardman tires.
- Hardy & Co., F. A., New York City—Autoglass goggles.
- Hardy Co., R. E., Chicago, Ill.—Starite spark plugs.
- Harris Oil Co., A. W., Providence, R. I.—Lubricants.
- Harrison Radiator Co., Lockport, N. Y.—Radiators.
- Hartford Machine Screw Co., Hartford, Conn.—H. M. S. spark plugs and combined cooling and inflating pump.
- Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, jacks and engine starters.
- Havoline Oil Co., New York City—Lubricants.
- Haws, George A., New York City—Lubricants.
- Hawthorne Mfg. Co., Bridgeport, Conn.—Old Sol lamps.
- Hayes Mfg. Co., Detroit, Mich.—Metal bodies and boxes.
- Heinze Electric Co., Lowell, Mass.—Magnetos, coils, and other ignition devices.
- Herz & Co., New York City—Magnetos and other ignition devices.
- Hess-Bright Mfg. Co., Philadelphia, Pa.—H. B. ball bearings and ball bearing grease.
- Hess Spring & Axle Co., Cincinnati, Ohio—Hess axles and springs.
- Hodgman Rubber Co., New York City—Rubber wearing apparel.
- Hoffecker Co., Boston, Mass.—Speedometers and odometers.

Hoffnung & Co., S., New York City—Coventry chains and "Fastnut" lock washers.

Hollingshead Co., R. M., Camden, N. J.—Whiz dressings, oils, soaps and greases.

Homo Co., of America, Philadelphia, Pa.—Homo mixer.

Horseless Age Co., New York City—Publications.

Houpt, H. J., New York City—Gears and sprockets.

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt roller bearings.

Hydraulic Oil Storage Co., Detroit, Mich.—Oil tanks and storage systems.

Ideal Wind Shield Co., New York City—Windshields and tops.

Ignition Starter Co., Detroit, Mich.—Disco engine starter.

Imperial Bearing Co., Detroit, Mich.—Ball bearings.

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

International Metal Polish Co., New York City—Blue Ribbon polish.

Jackson Church Wilcox Co., Saginaw, Mich.—Parts.

Janney, Steinmetz & Co., Philadelphia, Pa.—Engine starters and seamless steel tanks.

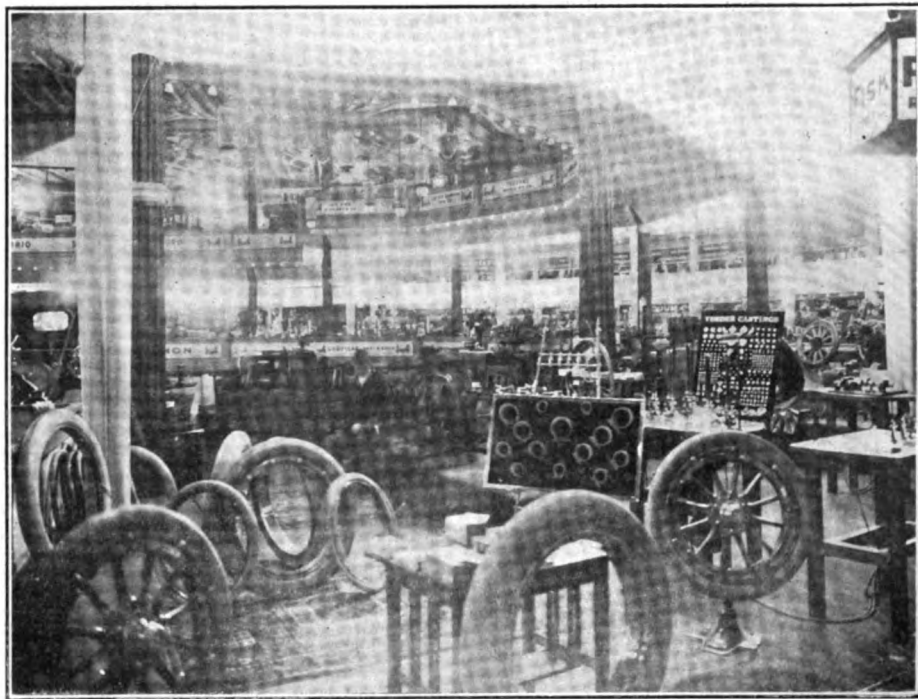
Jeffrey-Dewitt Co., Detroit, Mich.—Reliance spark plugs.

J. M. Shock Absorber Co., Philadelphia, Pa.—J. M. shock absorbers.

Johnson & Co., Isaac G., Spuyten Duyvil, N. Y.—Forgings and castings.

Jones & Co., Phineas, Newark, N. J.—Wood wheels.

Jones Speedometer Co., New York City—Speedometers, odometers, annunciators and specialties.



FISK TIRE EXHIBIT OVERLOOKING FIRST BALCONY

Kellogg Mfg. Co., Rochester, N. Y.—Kellogg hand and power air pumps.

Keystone Lubricating Co., Philadelphia, Pa.—Keystone oils and grease.

K.-W. Ignition Co., Cleveland, Ohio—Ignition devices.

Laidlaw, Wm. R., Jr., New York City—Waterproof fabrics.

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads.

Lee Tire & Rubber Co., Conshohocken, Pa.—Jelco-Atlas puncture proof inner case.

Lefever Arms Co., Syracuse, N. Y.—Specialties.

Light Mfg. & Foundry Co., Pottstown, Pa.—Aluminum parts and castings.

Link Belt Co., Indianapolis, Ind.—Chains.

Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns and bumpers, and Raiswell packs.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and gaskets.

McCue Co., Buffalo, N. Y.—Axles.

McGinnis, F. T., New York City—Broc rotary valve motor.

Manufacturers Foundry Co., Waterbury, Conn.—Castings.

Marburg Bros., Inc., New York City—Mea magnetos.

Masury & Son, John W., New York City—Paints and varnishes.

Mead Engine Co., Dayton, Ohio—Rotary valve motors.

Merchant & Evans & Co., Philadelphia, Pa.—Hele-Shaw Universal clutch, Star tire jackets, etc.

Metal Stamping Co., Long Island City, N. Y.—Stampings.

Meteor Auto Tank Co., New York City—Meteor acetylene tanks and engine starters.

Mezger, C. A., Inc., New York City—Windshields and "Soot-proof" spark plugs.

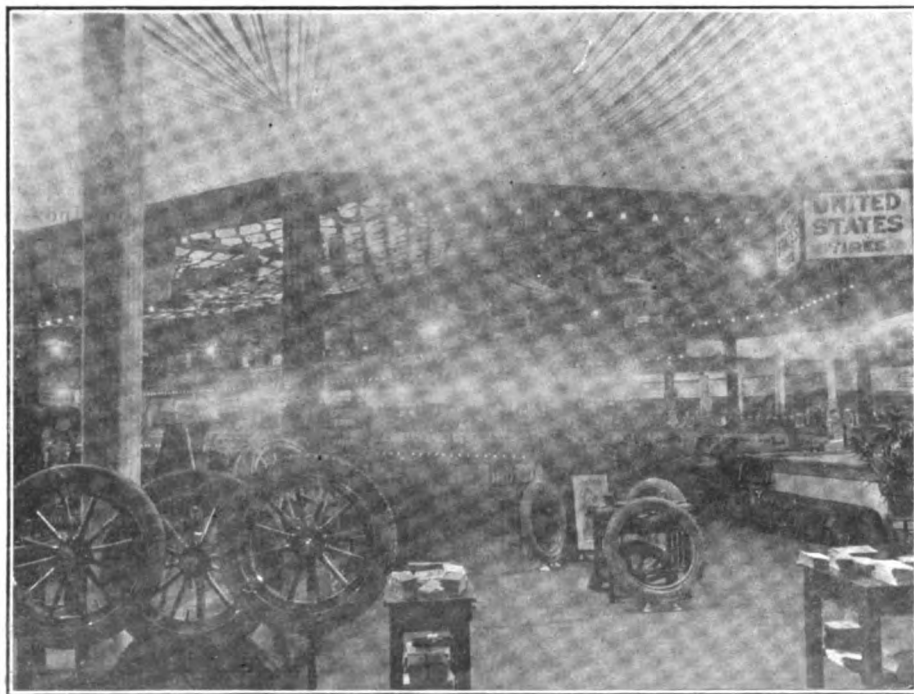
Michelin Tire Co., Milltown, N. J.—Michelin tires.

Miller, Charles E., New York City—Pan-American oils, Brampton chains and gears, and supplies.

Miller's Sons, William P., Long Island City, N. Y.—Excelsior fibrous oils.

Modern Auto Appliance Co., Chatham, N. Y.—Anti-skid chains.

Morrison-Ricker Mfg. Co., Grinnell, Iowa—Grinnell gloves.



WHERE UNITED STATES TIRES ARE DISPLAYED

Mosler & Co., A. R., New York City—Spitfire and Breech-block spark plugs, and odometers.
 Mossberg Co., Frank, Attleboro, Mass.—Mossberg wrenches and bells.
 Motor, New York City—Publications.
 Motor Car Equipment Co., New York City—Supplies.
 Motor Vehicle Publishing Co., New York City—Publications.
 Motor World Publishing Co., New York City—The Motor World.
 Motz Clincher Tire & Rubber Co., Akron, Ohio—Motz cushion tires.
 Muncie Gear Works, Muncie, Ind.—Wheels, gears, etc.

sey City, N. J.—Tires and inner tubes.
 Newmastic Tire Co., New York City—Tire filling compound, and demountable rims.
 New Miller Mfg. Co., Los Angeles, Cal.—New Miller carburetter.
 New York Coil Co., New York City—Ignition apparatus.
 New York & New Jersey Lub. Co., New York City—Columbia lubricants.
 New York Sporting Goods Co., New York City—Supplies.
 New York V-Ray Sales Co., Syracuse, N. Y.—V-Ray spark plugs.
 Niagara Lead & Battery Co., Niagara Falls, N. Y.—Storage batteries.

Philadelphia Storage Battery Co., Philadelphia, Pa.—Storage batteries.
 Piel Co., G., Long Island City, N. Y.—Long horns and muffler cut-outs.
 Pittsfield Spark Coil Co., Dalton, Mass.—Magnetos, coils, plugs and other ignition devices.
 Polson Mfg. Co., Buffalo, N. Y.—Windshields.
 Portage Rubber Co., Akron, Ohio—Portage tires.
 Power Wagon Publishing Co., Chicago, Ill.—Publications.
 Prince Tire Co., New York City—Tires and tubes.



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 Narragansett Chemical Co., Providence, R. I.—Meteor oils, greases and polishes, and storage batteries.
 Nash Co., George, New York City—Iron, steel and copper, seamless tubing.
 Nathan Novelty Mfg. Co., New York City—Leggins, bags and waterproof specialties.
 National Carbon Co., Cleveland, Ohio—Dry cells.
 National Coil Co., Lansing, Mich.—Spark coils.
 National Rubber Co., St. Louis, Mo.—Rubber preservatives.
 National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
 New Departure Mfg. Co., Bristol, Conn.—Ball bearings.
 New Jersey Car Springs & Rubber Co., Jer-

Noera Mfg. Co., Waterbury, Conn.—Pumps and oil cans.
 Noonan Tool & Mach. Works, A. S., Rome, N. Y.—Noonan tools and specialties.
 North East Electric Co., Rochester, N. Y.—Ignition apparatus and engine starters.
 Northway Motor & Mfg. Co., Detroit, Mich.—Motors.
 Oliver Mfg. Co., Chicago, Ill.—Peerless jacks.
 Pantasote Co., New York City—Tops and upholstery materials.
 Paragon Auto Parts Mfg. Co., New York City—Radiators and sheet metal parts.
 Paris Electric Starter Co., Paris, Ill.—Paris engine starter.
 Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania and Polack tires.
 Perfection Spring Co., Cleveland, Ohio—Perfection Automobile springs.
 Perfect Window Regulator Co., New York City—Window regulating devices.

Prosser & Son, Thomas, New York City—Prop steels.
 Randall-Faichney Co., Boston, Mass.—Jericho horns and B-line grease guns.
 Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting apparatus.
 Republic Rubber Co., Youngstown, Ohio—Republic tires.
 Rhineland Machine Works Co., New York City—Ball bearings.
 Rielly & Son, P., Newark, N. J.—Patent and enameled leather.
 Riley-Klotz Mfg. Co., Newark, N. J.—Bulb horns.
 R. I. V. Co., New York City—R. I. V. ball bearings.
 Rose Mfg. Co., Philadelphia, Pa.—Never-out lamps, licenses, brackets and radiator heaters.
 Ross Gear & Tool Co., Lafayette, Ind.—Steering gears.
 Royal Equipment Co., Bridgeport, Conn.—Band brakes and bestos brake lining.

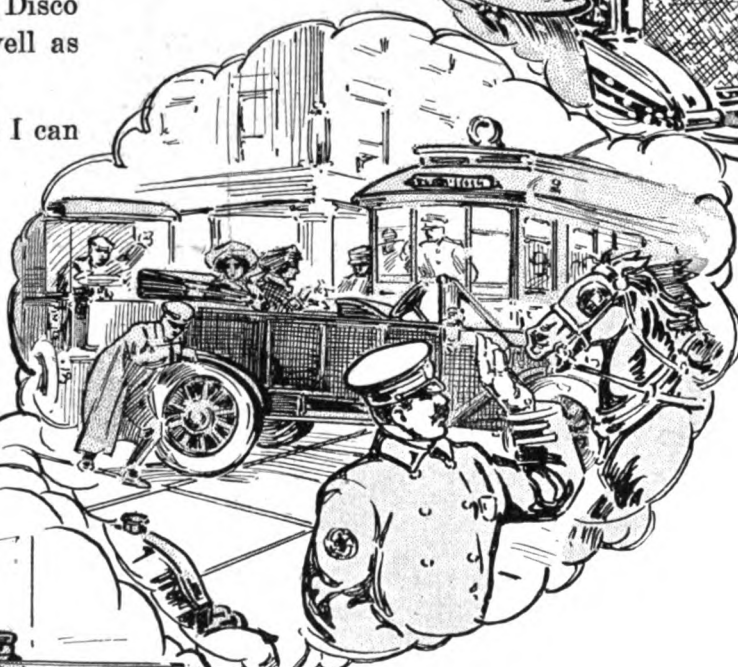
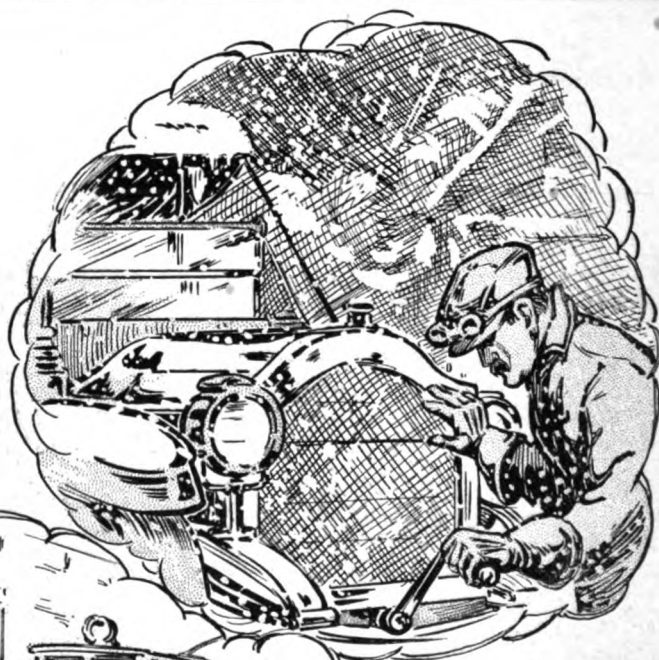
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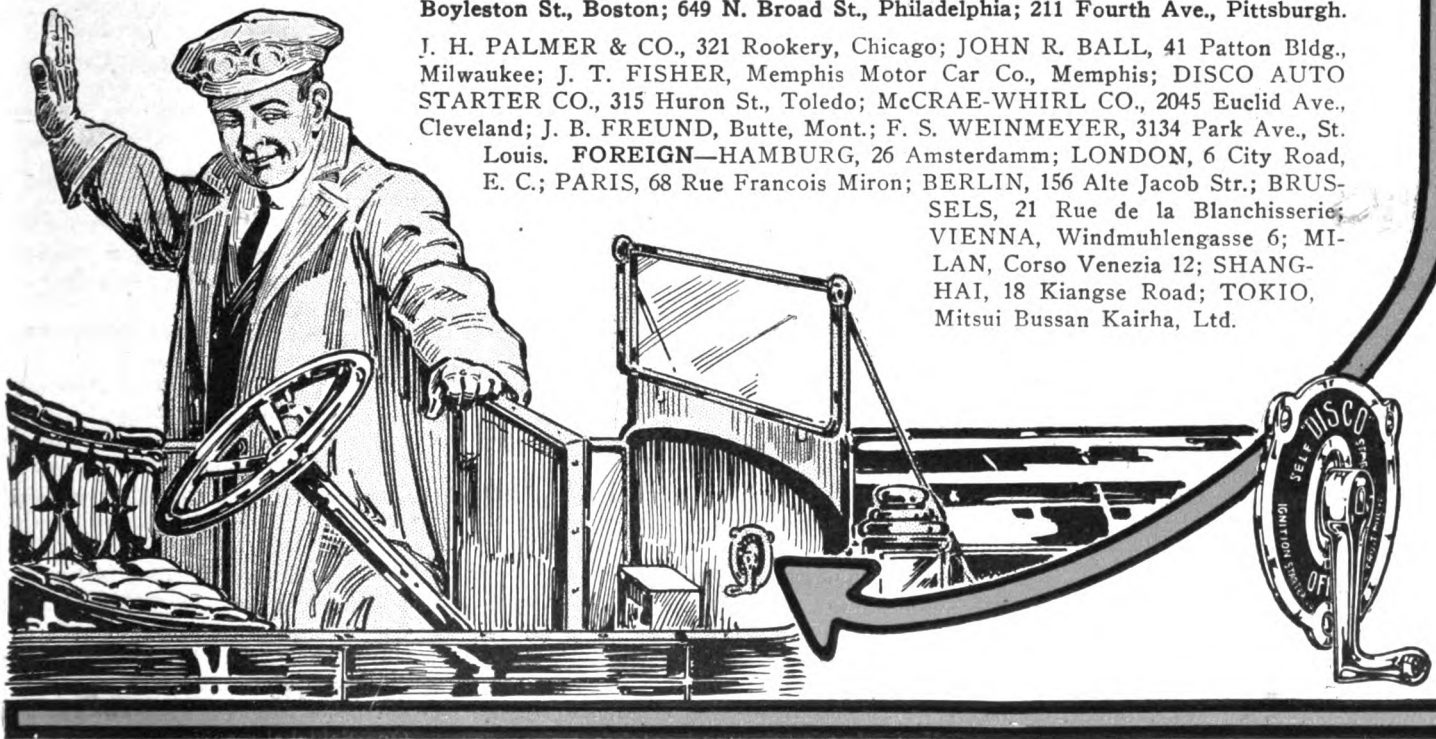
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 Sager Co., J. H., Rochester, N. Y.—Sager bumpers and supplementary springs.
 S. & S. Shock Absorber Co., Washington, D. C.—S. & S. shock absorbers.
 S. B. R. Specialty Co., East Orange, N. J.—S. B. R. muffler cutout, wire clamps, etc.
 Seamless Rubber Co., New Haven, Conn.—Bragg stitched tires.
 Shaler Co., C. A., Waupum, Wis.—Steam and electric vulcanizers.
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 Sonora Motor Horn Co., New York City—Horns.
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 Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.
 Splittorf, F. C., Inc., New York City—Splittorf magnetos and plugs.
 Sprague Umbrella Co., Norwalk, Ohio—Tops and windshields.
 Springfield Metal Body Co., Springfield, Mass.—Metal bodies.
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 Standard Thermometer Co., Boston, Mass.—Standard speedometers.
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 Standard Tire Protector Co., Akron, Ohio—Standard tire protectors.
 Standard Welding Co., Cleveland, Ohio—Electrically welded tubing and parts.
 Stanley, John T., New York City—Oils and greases.
 Star Speedometer Co., Milton, Pa.—Star speedometers.
 Start-Lite Co., Chicago, Ill.—Automatic lighting devices.
 Stein Double Cushion Tire Co., Akron, Ohio—Cushion tires.
 Sterling Hardware Co., New York City—Hardware specialties.
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Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.
 Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carbureters.
 Stutz Auto Parts Co., Indianapolis, Ind.—Axles and transmissions.
 Syracuse & Eldridge Glove Co., Syracuse, N. Y.—"Northrup" gloves and leggins.
 Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.
 Tarjian & Co., J. M., New York City—Tisafine hand paste.
 Texas Co., New York City—Lubricants.
 Thompson Auto Co., Andrew C., Plainfield, N. J.—Engine starters.
 Timken Detroit Axle Co., Detroit, Mich.—Axles.
 Timken Roller Bearing Co., Canton, Ohio—Roller bearings.
 Tingley & Co., Charles O., Rahway, N. J.—Tire patches and vulcanizing outfits.
 Torbensohn Gear & Axle Co., Bloomfield, N. J.—Gears and axles.
 Tracy, Joseph, New York City—Dynamometer and testing apparatus.
 Treadwell Engineering Co., Lebanon, Pa.—Steel castings.
 Troy Carriage Sunshade Co., Troy, Ohio—Windshields, tops and speedometers.
 Tryon Auto Pump Co., New York City—Friction driven tire pump.
 Tucker Co., Charles H., New York City—Tires and inner tubes.
 Tucker Tool & Machine Co., New York City—Screw plates and tools.
 Turner Brass Works, Sycamore, Ill.—Braze apparatus, tire pumps, etc.
 Typhoon Signal Co., Chicago, Ill.—Typhoon automobile signal.
 Union Auto Specialties Co., Brookville, Pa.—Windshields.
 United Rim Co., Akron, Ohio—Standard universal rims.
 United States Auto Horn Co., New York City—Bulb horns.
 United States Light & Heat Co., New York City—Storage batteries.
 United States Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.
 United Steel Co., New York City—Vanadium steel.
 Vacuum Oil Co., Rochester, N. Y.—Vacuum Mobiloil.
 Valentine & Co., New York City—Var-nishes.
 Vanadium Metals Co., Pittsburgh, Pa.—Victor vanadium bronze and "non-corrosive" silver.
 Van Auken Indicator Co., New York City—Gasoline indicators.
 Vanguard Mfg. Co., Joliet, Ill.—Windshields, bumpers, stampings, castings.
 Veeder Mfg. Co., Hartford, Conn.—Speedometers and odometers.
 Velox Polish Mfg. Co., New York City—Velox polishing cloths.
 Vesta Accumulator Co., Chicago, Ill.—Accumulators.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.—Inner tubes and patches.

Ward Leonard Electric Co., Bronxville, N. Y.—Lighting dynamos.
 Warner Gear Co., Muncie, Ind.—Gears and parts.
 Warner Instrument Co., Beloit, Wis.—Warner autometers.
 Warner Mfg. Co., Toledo, Ohio—Motors, transmissions and steering gears.
 Wasson Piston Ring Co., Bayonne, N. J.—Wasson piston rings.
 Wayne Oil Tank & Pump Co., Fort Wayne, Ind.—Wayne oil tanks.
 Weed Chain Tire Grip Co., New York City—Weed tire chains.
 Weston Mfg. Co., Newark, N. J.—Weston shock absorbers.
 Weston-Mott Co., Flint, Mich.—Rims and wheels.
 Western Tool & Forge Co., Brackenridge, Pa.—Forgings and tools.
 Wheeler & Schebler Co., Indianapolis, Ind.—Schebler carbureters and magnetos.
 Wetherill Finished Castings Co., Philadelphia, Pa.—Castings.
 White & Bagley Co., Worcester, Mass.—Lubricants.
 Whitney Mfg. Co., Hartford, Conn.—Whitney chains.
 Willard Storage Battery Co., Cleveland, Ohio—Elba storage battery lighting outfits.
 Willey Co., C. A., Long Island City, N. Y.—Forgings.
 Winn, William R., New York City—Greases, oils, polishes.
 Wolverine Lubricants Co., New York City—Lubricants.
 Young, O. W., Newark, N. J.—Lubricants.

Motorcycles.

American Motor Co., Brockton, Mass.—Four M-M machines.
 Aurora Automatic Machinery Co., Chicago, Ill.—Five Thor machines.
 Consolidated Mfg. Co., Toledo, Ohio—Five Yale machines.
 Emblem Mfg. Co., Angola, N. Y.—Five Emblem machines.
 Excelsior Supply Co., Chicago, Ill.—Six Excelsior machines.
 Flanders Mfg. Co., Pontiac, Mich.—Five Flanders machines.
 Harley-Davidson Motor Co., Milwaukee, Wis.—Four Harley-Davidson machines.
 The Hendee Mfg. Co., Springfield, Mass.—Six Indian machines.
 Henderson Motorcycle Co., Detroit, Mich.—One Henderson machine.
 The Miami Cycle & Mfg. Co., Middletown, Ohio—Five Merkel machines.
 Minneapolis Motorcycle Co., Minneapolis, Minn.—Four Minneapolis machines.
 New Era Auto Cycle Co., Dayton, Ohio—Three New Era machines.
 The Pierce Cycle Co., Buffalo, N. Y.—Four Pierce machines.
 Pope Manufacturing Co., Hartford, Conn.—Three Pope machines.
 Reading-Standard Co., Reading, Pa.—Three Reading-Standard machines.
 The Schickel Motor Co., Stamford, Conn.—One Schickel machine.

MEASURING THE MOTOR'S POWER

How It is Performed With an Indicator and What the Diagram Discloses—Internal Conditions Shown.

When James Watt built his first steam engine and set it to pumping water out of mines, the work having been done previously by horses, the most natural question in the world, and the one that came first to the tongues of those who contemplated the employment of the so-called "fire engines," was, "How many horses will one engine displace," or in other words, "What is the horsepower of one engine?" Needless to say, the same question has lived to the present day and "What is the horsepower of the engine?" has come to be probably the first of the many questions with which the ordinarily patient automobile salesman is harassed by intending purchasers and those who lack intentions.

To the average individual, the usual answer, 20 or 30 or 40 horsepower, as the case may be, is sufficient. It is a factor by means of which he may compare one engine with another after a certain crude fashion. The exact significance of the word "horsepower" is just as much an unknown quantity to the "prospect" or the salesman today as it was years and years ago to Watt when first he began his "invasion." Watt found that in order to market his engines successfully, he must be able to tell intending purchasers how much work his engine could do as compared with the amount done by a horse, the energy expended by a horse then being the only unit available for comparison. Besides, the unit was convenient, and since then it has continued to be the most convenient method of expressing the available power output from any prime mover whether it be of the internal or external combustion variety.

As to just what one horsepower is, however, there is considerable confusion. In the course of his investigations, Watt found that the average horse, working a certain number of hours a day, could do an amount of work equivalent to raising 22,000 pounds one foot high in one minute, or 22,000 foot-pounds a minute. He also found that for shorter periods, a horse could do work generally in excess of 22,000 foot-pounds a minute. Therefore, to be on the safe side, it is said, he decided to call "one horsepower" the ability to perform work equivalent to raising 33,000 pounds one foot high in one minute, or 33,000 foot-pounds a minute.

At about the same time other experimenters who had been at work on the same problem obtained results that differed but slightly from that obtained by Watt. For instance, Trædgoll found that a horse working eight hours did work equivalent to 27,-

000 foot-pounds a minute; Rennie obtained 22,000 foot-pounds a minute; Beardmore is stated to have obtained 30,000 foot-pounds a minute for eight hours from a horse weighing a little over half a ton; Smeaton set the figure at 29,916 foot-pounds a minute and Morin made it 26,150.

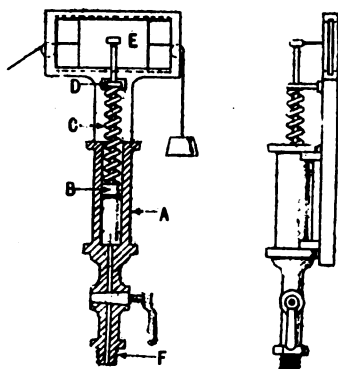


FIG. 1

All of which, and more, is set forth by A. Marsden, who is a British engineer, in the Autocar, in leading up to an illuminative article dealing with the intricacies of construction and operation of the engine indicator. Though the motorist is perhaps most concerned with the horsepower delivered at the flywheel of his engine, or pos-

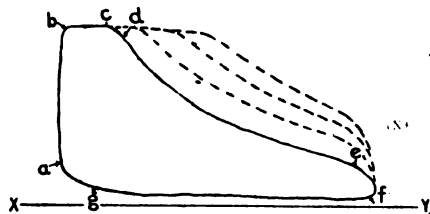


FIG. 2

sibly at the rear wheels of his car, to the engineer, the power developed inside the engine cylinders is of much greater moment. For this purpose, an instrument styled an indicator is used, and though it is a more or less complicated device about which the average motorist knows little or nothing, like any number of other things it is extremely interesting when it is dis-

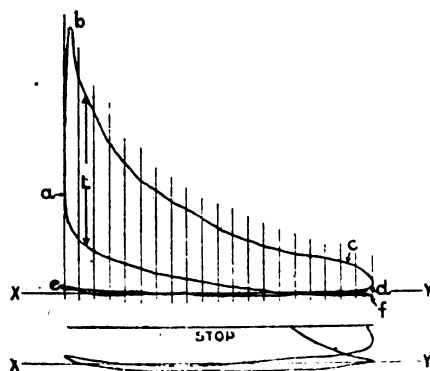


FIG. 3

sected and its modus operandi is laid bare.

"This instrument," says Marsden, "as its name implies, is one by which the happenings inside the cylinder of an engine are

made known. By studying the diagram made by its use, the engineer is able to ascertain if any leakage of the working medium past the piston is occurring and that the valves are properly set so as to give the best results. In addition to these matters, the diagram is a factor used in calculating the indicated horsepower of the engine. The importance of the indicator seems to have been appreciated thoroughly by James Watt, whose invention it was, so much so in fact, that it remained the secret of the inventor for several years, and was only more or less accidentally brought to light.

"Watt's indicator was a more or less crude affair in comparison with the indicators of to-day, although it undoubtedly answered its purpose and gave satisfaction to its inventor. The characteristics of Watt's instrument may be seen in Fig. 1. It consists of a cylinder, A, in which works a piston, B, pressed downward by a helical spring, C. The piston rod works through a collar, D, which also acts as a stop for the spring. At the free end of the piston rod is attached a short pencil which just touches the card E, to which are affixed two pieces of cord, one loose and the other with a small weight attached. The instrument is fixed to the cylinder end of the engine by means of the screwed part, P. It will be seen that, if the underside of the piston, E, be acted upon by the pressure inside the engine, it will be lifted a certain amount according to the intensity of the pressure and the strength of the spring. This would cause the pencil to describe a vertical line upon the card, E, and if the card is caused to make a reciprocating motion which synchronises with the movement of the engine piston an irregular figure will be traced by the pencil. This figure will be an indication of the pressure inside the engine at any instant of the stroke.

"Of course, Watt's indicator has long ago been improved out of recognition, and numerous other types on a different principle, capable of being of service with high speed engines, have been evolved. But the underlying idea is the same—the varying pressures inside the cylinder are indicated on a card, or in some cases by the oscillations of a beam of light taking effect upon a photographic sensitive plate. For our explanatory purpose the description of Watt's indicator is, however, sufficient. An example of a well-informed indicator diagram as given by a steam engine is shown in Fig. 2.

"Starting from a, which is the position of the pencil at the end of the stroke, the steam enters the engine cylinder and causes the pencil to trace the nearly vertical lines a b, which is called the "admission line;" at b the maximum boiler pressure is obtained and the engine has begun to move, so that the pencil traces the line b c, called the steam line, which shows that the full boiler pressure is maintained until c is reached where the "cut-off" commences,

steam being totally cut off at d. From d the steam, which is now trapped in the cylinder of the engine, does work by expanding down to e, called the 'expansion line,' and at e the opening of the exhaust valve, with the consequent escape of the steam, causes the line e f to be traced. From f to g on the return stroke, the exhaust valve is wide open and the remaining steam is being pushed out of the cylinder by the piston, f g being called the 'back pressure line.' At g the exhaust valve closes and causes the remaining steam to be trapped in the cylinder and compressed, thereby tracing the line g a. This compression is to act as a buffer for the moving parts of the engine. The line X Y is the 'atmospheric pressure line,' made by the indicator pencil before steam is admitted to the instrument.

"For a double-acting engine, i. e., where steam is admitted to both sides of the piston, two diagrams are of course required—one from each end of the cylinder—in order to see that the powers developed on both sides of the piston are as nearly equal as possible, and also to obtain the horsepower developed at both ends.

"It is needless to say that all steam engine diagrams must not necessarily correspond exactly with that shown in Fig. 2. For instance, steam might be admitted to the cylinder for a longer period, which would lengthen the steam line b c and shorten the expansion line d e, or vice versa. This is a property of great importance inherent to steam engines, whereby the torque on the crankshaft may be kept at a much greater mean if required, as when starting the engine under full load, and is one of the reasons why a steam engine is claimed to be more 'elastic' than a gasoline engine. A point worth noting here is that, although there is a slight compression line to the steam diagram, this compression is intended for quite a different purpose from the compression stroke of the gasoline engine.

"Steam engines being mostly double-acting, i. e., with steam pressure acting on both sides of the piston alternately, it follows that there would be a fair amount of knocking when running, owing to the slackness in the reciprocating parts being taken up first on one side and then on the other, and it has been found that it is essential to bring all reciprocating parts to rest, by allowing the piston to compress a little of the exhaust steam at the end of each stroke.

The diagram is also different with internal combustion engines, of which class are gas engines and gasoline engines. There is little or no horizontal line (b c, Fig. 2); the ignition of the mixture being very rapid, the pressure immediately rises to b (Fig. 3), and then as the piston moves out immediately expands down to c. At this point the exhaust valve begins to open, being practically fully open by the time d is reached. From d to e on the return stroke (exhaust) the cylinder remains open to the atmosphere, and the pencil traces the

back pressure line. From e to f is the suction stroke; it shows the reduction of pressure below atmosphere while the engine piston is drawing in a fresh charge of mixture. The line f a is the compression line given while the charge is being compressed to the high pressure, necessary for economy, previous to being ignited. It will be seen

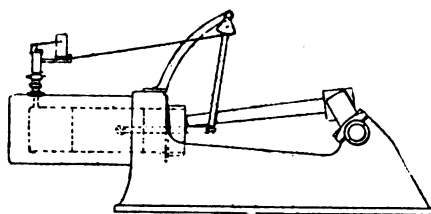


FIG. 4

that the exhaust line d e and the suction line e f lie very close together, the reason for this being the small movement transmitted to the indicator piston at these low pressures against the strong spring required to withstand the explosion pressure.

"Where it is required to investigate the 'pumping strokes,' a suction and exhaust are called, it is necessary to replace the

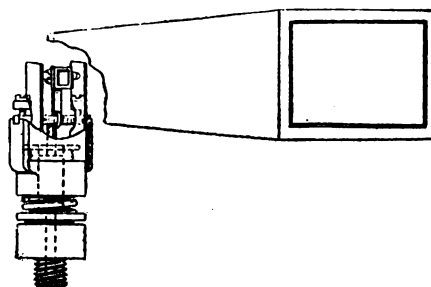


FIG. 5

strong spring with a very light one, so that the differences in pressure on these strokes are more easily ascertained, care being taken to put a stop on the indicator piston to limit its movement, or the indicator will be damaged on the explosion of the charge. The lower diagram in Fig. 3 shows the exhaust and inlet strokes on a large scale.

"From the foregoing it will be obvious

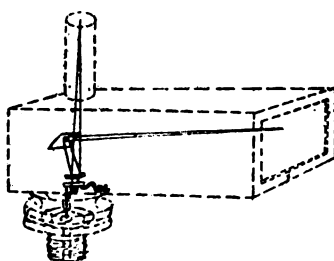


FIG. 6

that with the very high pressures that are generated inside the cylinders of modern engines, much stronger springs have to be employed in the indicator than were required in James Watt's days, and the motion of the small piston has to be multiplied by levers in order that a fair-sized diagram may be obtained. The card also, instead of being straight is placed on a

drum which is partially rotated by a cord, there being a spring inside the drum which brings it back on the return stroke.

"A method of attaching as thus constructed to an ordinary gas engine is shown in Fig. 4, which illustrates how the vertical straight line motion of the pencil is obtained by means of parallel motion links; and also how the reciprocating motion of the engine piston is reduced to that necessary to operate the recording drum.

"To calculate the indicated horsepower it is first necessary to measure from the indicator cord the mean pressure throughout the stroke. This is obtained from the diagram by various means, the most common being probably that of parallel ordinates shown in Fig. 3. The diagram is carefully divided into a number of vertical sections—twenty is a good number—by lines at right angles to the atmospheric line. These sections are then very carefully measured at the center of each as at L, with a scale in accordance with the spring used, or, if measured with an ordinary steel rule, the result must be multiplied by the scale of the spring. These twenty dimensions are then added together and divided by 20, so that the result then gives the average height of the diagram, or, in other words, the mean pressure on the engine piston throughout the stroke.

"The indicated horsepower for each cylinder is then calculated by means of the formula:

PLAN

33,000

Where P=mean pressure in pounds per square inch

L=Length of stroke in feet

A=Area of piston in square inches

N=Number of explosion strokes a minute

33,000—Foot-pounds of work done a minute by a horse.

"With the high speeds of revolution in use in gasoline engines, the indicators as used for steam and gas engines do not give good results, chiefly owing to the inertia of the moving parts of piston and levers, which renders the instrument sluggish in responding to the demand of such work; in fact, until quite a recent date one could safely say that it was useless to endeavor to obtain indicator diagrams from a gasoline engine as constructed for motor car work. Several indicators recently have recently been constructed, however, which make it possible to obtain indicator diagrams from gasoline engines with a degree of accuracy which cannot be excelled by the most accurate of indicators as used for slow speed engines.

"Fig. 5 is a diagrammatic illustration of Dr. Hopkinson's indicator. In this instrument the piston is exceedingly light as are the other moving parts and the movement which is transmitted also is exceedingly small. The pressure acting on the under side of the piston is resisted by a carefully calibrated rectangular section spring

bar, and the deflection of this bar is transmitted to a small rocking shaft which carries a mirror. The mirror receives on its surface a beam of light from an electric lamp, which it reflects as a small spot of light upon the ground glass window of a camera-like arrangement. The upper part of the indicator is fitted with ball bearings, so that a very small semi-rotary motion may be given to it from some moving part of the engine. The final result being that when the instrument is in use a spot of light traces on the screen a diagram similar to Fig. 3.

Fig. 6. is a diagrammatic illustration of Dr. Watson's indicator. In this instrument, the piston is entirely done away with there being used in its place a circular corrugated sheet steel diaphragm. The deflections of the diaphragm caused by the pressure action on its under side are transmitted to a rocking mirror against the resistance of a peculiarly shaped spring. A beam of light is projected directly on to the diaphragm mirror, which is given a rocking motion in one direction from the diaphragm. This light is reflected on to another mirror, which is given a rocking motion at right angles to the first mirror by some moving part of the engine; the result being a diagram traced by a spot light upon a ground glass screen. Where it is only necessary to obtain an optical indication of what is taking place inside the engine cylinder, inspection of the ground glass screen when the instrument is at work is all that is necessary, as the spot of light travels so quickly that it gives quite a permanent appearance to the diagram, and one can easily obtain particulars as to valve setting, ignition, etc., from it.

"Where, however, a permanent record is required, as, for instance, when it is desired to calculate the indicated horsepower, the ground glass screen has to be replaced by a photographic plate, which is afterwards developed. It will be seen that by using a beam of light instead of the usual motion multiplying levers and parallel motion links that great saving of weight is attained with consequent delicacy of operation.

"The brake-horsepower of an engine is that which is ascertained by means of a

friction brake on the flywheel or on a pulley in close proximity to it. The brake-horsepower is necessarily always less than the indicated horsepower, and the difference in the quantities denotes the power which the engine absorbs in actually driving itself. Instead of using a friction brake the power may be absorbed by other means, such as a dynamo or by fan vanes clamped to the engine-shaft, the only requirement being a correct knowledge of the amount of horsepower actually required or taken up by the dynamo or fan. The simplest and

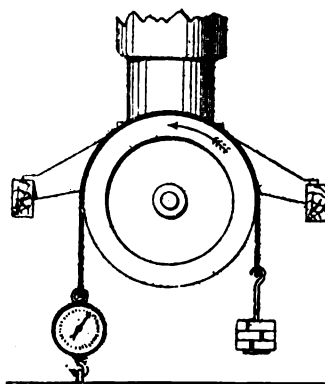


FIG. 7

more common method still appears to be the old-fashioned friction brake or absorption dynamometer, and, after all, it gives results when properly used which can hardly be excelled even by the more elaborate methods.

"Fig. 7 shows a method of using a brake for this purpose. It must be remembered that to absorb the power by means of a brake generates heat which must be kept within bounds or both the pulley and the brake will be damaged, so that where much testing is to be done it is desirable to have a pulley with a hollow or channel section rim, so that it may be kept cool with water. To obtain the required data, the engine is first started up and allowed to run a little while so that it assumes normal temperature; the band brake is then slipped on to the pulley, care being taken that it is well anchored and guarded so as not to be thrown off. Weights are then added until no more may be put on without reducing

the speed of the engine below that at which it is required to take a test.

$$\text{B.H.P.} = \frac{2 r \times 3.1416 \times R \times (W-w)}{33,000}$$

Where r = radius in feet from center of shaft to center of rope or belt of the brake.

R = revolutions per minute of the pulley.

W = total load on brake in pounds.

w = weight or reading of the spring balance in pounds.

"There are numbers of motorists who cannot grasp the true sense of this formula, and it may be approached in another way if we suppose that instead of a friction brake the engine is hoisting up a weight by means of a rope which is being coiled on to the flywheel. If we suppose it to be just capable of lifting a weight of 30 pounds 2,000 feet in one minute, then neglecting the weight of the rope, the work done per minute equals 60,000 foot-pounds, and this divided by 33,000 gives the horsepower. The formula often is stated as $.0001904 r \times R (W-w)$. $.0001904$ being simply the result of dividing 2×3.14159 by 33,000.

"The mechanical efficiency of an engine is always, as stated before, a fraction of a whole, and is denoted by

$$\text{mechanical efficiency} = \frac{\text{B.H.P.}}{\text{I.H.P.}}$$

or, in other words, the energy taken out always is less than that put in by the working stroke. If an engine gives 12 indicated horsepower and 10.08 brake horsepower, the mechanical efficiency equals 10.08 divided by 12, which equals .84, or 84 per cent.; the difference between 12 and 10.08, namely, 1.92, is the horsepower expended in frictional and pumping losses driving the engine itself.

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INDEX TO ADVERTISERS



Abbott Motor Co.....	351	Gray & Davis.....	260	Nordyke & Marmon.....	356
Adamson Mfg. Co.....	356	Grossman, Emil, Co.....	378	Not-A-Crank Gas Engine Starter Co.....	280-81
Ajax-Grieb Rubber Co.....	372				
American Ball Bearing Company.....	270	H		P	
American Motors Co.....	255	Hartford Auto Parts Co.....	286	Packard Electric Co.....	379
American Starter & Carbureter Mfg. Co.....	377	Hartford Suspension Co.....	246	Parish Mfg. Co.....	355
Anderson Spark Plug Co.....	354	Haynes Automobile Co.....	374	Perfection Spring Co.....	354
Apple Electric Co.....	355	Henderson Motor Sales Co.....	374	Petrel Motor Car Co.....	377
Argo Electric Vehicle Co.....	273	Hot-Spark Plug Co.....	285	Pittsfield Spark Coil Co.....	365
Atwater-Kent Mfg. Wks.....	283	Hupp, R. C.....	374	Pullman Motor Car Co.....	377
Automobile Supply Co.....	377	Hupp Motor Car Co.....	262		
		Hyatt Roller Bearing Co.....	264	Q	
B		Hydraulic Pressed Steel Co.....	355	Queen Manufacturing Co.....	366-67
Badger Brass Mfg. Co.....	356			Quimby, J. M., & Co.....	354
Baldwin Chain & Mfg. Co.....	357	I			
Barthel, Daly & Miller.....	380	Ideal Motor Car Co.....	376	R	
Bartholomew Co.....	371	Ignition Starter Co.....	346-347	Rajah Auto Supply Co.....	379
Bosch Magneto Co.....	257	International Accessories Corp.....	371	Remy Electric Co.....	375
Bossert Co.....	355	Inter-State Automobile Co.....	284	Royal Equipment Co.....	378
Bower Roller Bearing Co.....	249	Invincible Starter Co.....	244		
Bretz, J. S., Co.....	282			S	
Briggs-Detroit Co.....	377	J		Sackman Mfg. Co.....	355
Briggs Magneto Co.....	358	Jamestown Wheel & Mfg. Co.....	354	Safety Tire Gauge Co.....	355
Briscoe Mfg. Co.....	368	Jeffery-DeWitt Co.....	250	Salisbury Wheel & Mfg. Co.....	380
Brown-Lipe Gear Chapin Co.....	379	Johns-Manville, H. W., Co.....	373	Sampson, Alden Mfg. Co.....	254
Brush Runabout Company.....	254	Jones Speedometer.....	378	Schrader's Son, A., Inc.....	372
Bush Mfg. Co.....	354			Selden Motor Vehicle Co.....	377
		K		Shaler, C. A., Co.....	365
C		Kellom, Chas. F., & Co.....	355	Shawmut Tire Co.....	356
Cartercar Co.....	287	Kinsey Mfg. Co.....	369	Smith, A. O., Co.....	379
Champion Ignition Co.....	357	Kinsler-Bennett Co.....	378	Sparks-Withington Co.....	256
Champion Spark Plug Co.....	274	Kissel Motor Car Co.....	360	Speedwell Motor Car Co.....	267
Clark-Carter Automobile Co.....	376	Kline Motor Car Corp.....	380	Splitdorf, C. F.....	271
Classified Advertising.....	353	Knox Automobile Co.....	374	Springfield Metal Body Co.....	355
Colby Motor Co.....	374			Standard Roller Bearing Co.....	370
Columbia Motor Car Co.....	254	L		Standard Oil Co.....	375
Continental Motor Mfg. Co.....	355	Lauth-Juergens Motor Car Co.....	243	Standard Tire Protector Co.....	242
Corbin Motor Vehicle Co.....	376	Leather Tire Goods Co.....	354	Stearns, F. B., Co.....	376
Covert Motor Vehicle Co.....	269	Lewis Spring & Axle Co.....	361-62-63-64	Stewart & Clark Mfg. Co.....	252
Cramp, Wm. & Sons, Ship & Engine Building Co.....	378	Locomobile Company.....	354	Stromberg Motor Devices Co.....	245
Crosby Company.....	357	Lovell-McConnell Mfg. Co.....	Inside B. C.	Studebaker Corp.....	251
D		M		T	
Dayton Engineering Laboratories Co.....	359	Mais Motor Truck Co.....	377	Thomas, E. R., Motor Car Co.....	355
Dayton Motor Car Co.....	254	Manhattan Electrical Supply Co.....	375	Timken Roller Bearing Co.....	275
Dayton Rubber Mfg. Co.....	355	Manufacturers Foundry Co.....	379		
Dean Electric Co.....	253	Marion Sales Co.....	374	U	
Diamond Chain & Mfg. Co.....	378	Maxwell-Briscoe Motor Car Co., F. C.,	254	Union Sales Co.....	268
Diamond Rubber Co.....	248	Mayo Radiator Co.....	243	United Rim Co.....	356
		McIntyre, W. H., Co.....	377	U. S. Auto Horn Co.....	356
E		Metz, C. H.....	375	United States Motor Co.....	F. C., 254
Electric Welding Products Co.....	370	Metzger Motor Car Co.....	263	United States Tire Co.....	Inside Cover, 241
Empire Tire Co.....	374	Michelin Tire Co.....	378		
		Michigan Buggy Co.....	376	V	
F		Miller, Chas. E.....	258-59	Velie Motor Vehicle Co.....	247
Faries Manufacturing Co.....	379	Mosler, A. R., & Co.....	355		
Fedders Mfg. Co.....	379	Moss Photo Engraving Co.....	357	W	
F. I. A. T.....	356	Motor Car Equipment Co.....	355	Warner Gear Co.....	378
Firestone Tire & Rubber Co.....	278-79	Motor Wagon Co. of Detroit.....	266	Warner Instrument Co.....	375
Fisk Rubber Co.....	261	Mott Wheel Works.....	380	Weed Chain Tire Grip Co.....	272
Ford Motor Company.....	376	Motz Tire & Rubber Co.....	354	Western Motor Co.....	380
				Weston-Mott Co.....	276-77
G		N		Wetherill Finished Castings Co.....	380
Goodyear Tire & Rubber Co.....	265	National Motor Vehicle Co.....	363	Whitney Mfg. Co.....	373
		New Process Rawhide Co.....	379	Willys-Garford Sales Co.....	B. C.
				Willys-Overland Co.....	283
				Winton Motor Car. Co.....	376

THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 4

New York, January 18, 1912

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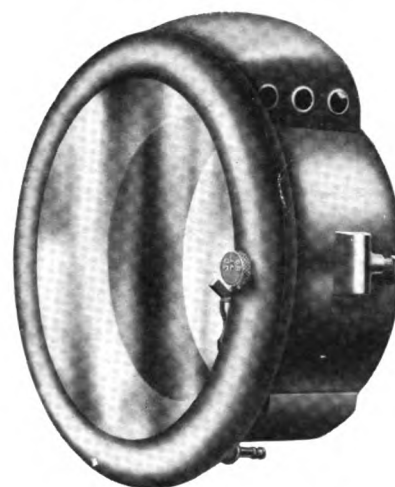
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UNITED STATES TIRE COMPANY

THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, January 18, 1912.

No. 4

STUDEBAKERS START THEIR MOVES

Flanders Finds He Isn't Through and Studebaker Lawyer Enters Flanders's Company—Parks First Man Out.

Walter E. Flanders was re-elected president of the Flanders Mfg. Co., of Pontiac, Mich., at the annual meeting of the corporation which occurred on Tuesday last, 16th inst. A. O. Smith, of Milwaukee, relinquished the vice-presidency, however, and was succeeded by Don C. McCord, the general manager of the company. H. L. Stanton was retained as secretary-treasurer, and J. B. Book, Jr., as assistant secretary-treasurer. Four new men, however, entered the directorate which has been changed several times during the past year; they are W. Kopmeier, W. M. Barber, J. M. Gunn and Scott Brown, who, with Flanders, McCord and Book, comprise the board. The seven per cent. dividend due on the preferred stock was not declared.

The meeting was full of possibilities that did not eventuate; whether they merely have been deferred remains to be seen. The election of Gunn and Brown as directors is suggestive at any rate. Gunn is the production expert who two months ago was appointed general manager of the entire Studebaker Corporation, of which Scott Brown is secretary and general counsel. Flanders is general manager of the Studebaker automobile division. He formed the Flanders Mfg. Co., a little more than a year ago, bringing into it five plants which he and his associates control. Later, he exchanged a large block of Flanders stock for no small parcel of Studebaker shares and in that way the Studebaker interests entered into the affairs of the Flanders company, Clement Studebaker being made a member of the board of directors.

Preceded and followed by plays and by-plays of the sort of which stage plays are made, Flanders assumed the presidency about two months ago. Previously he and several of his intimates in Detroit had

quietly organized the Commercial Engineering Co., which "experimented" with a six-cylinder car, which several people opined would make a "pot of money" under certain conditions. More recently Flanders became moved by another desire to "merge things," and if the Universal Motor Truck Co., of Detroit, had unbent slightly and untied a knot that developed it might now be merged with the Flanders Mfg. Co., as the Motor World stated last week.

Time at least is required to perform these things. Flanders has desired more of it. All of three months ago, it became known in inner circles that he was planning to leave the Studebaker Corporation. He was restrained only by a contract but "soon after January 1st" was the time set for bringing things to a head. According to reports, Flanders hoped that his contract would be broken somehow; but the Studebakers refused to be provoked into doing anything of the sort. Last week, Mr. Flanders met Mr. Gunn, the new general-manager-in-chief, and gave notice that he was "through." Mr. Gunn, according to these same well defined reports, let Mr. Flanders know that though he might consider himself "through," his salary would go on just the same and every letter of his contract be adhered to. Flanders then threatened to go to court to discover if his own contract drawn by his own lawyer legally binds him. A few days later, some of the Flanders staff came to New York and passed the word that the "break" between Flanders and Studebaker had come. But on Tuesday last, J. M. Gunn, general manager for the Studebaker Corporation and Scott Brown, the Studebaker lawyer, were elected members of the Flanders Mfg. Co.'s board of directors.

Meanwhile, F. K. Parks, fifth vice-president of the Studebaker Corporation, and a confidential man, has seen a light and resigned. There probably will be several other resignations, but strange to say, C. H. Booth, the E-M-F production manager, who also was a member of Flanders's inner circle, is being touted as Flanders's successor in case the latter convinces himself he is wholly "through."

METZGER FAVORS ONE ASSOCIATION

At Annual Meeting, N. A. A. M. President Declares Himself—Light Thrown on Show Situation and Other Things.

With 88 members on the roll—an increase of 25 during the year—and \$71,136 in the treasury, and much more in immediate sight, and with the National Association of Automobile Manufacturers otherwise well equipped to continue effective work for the whole trade, W. E. Metzger, its president, does not believe there is need for any other national organization of automobile makers.

He said so several times in the course of his report rendered at the annual general meeting of the N. A. A. M., which occurred in New York on Thursday last, 11th inst. The offices of the N. A. A. M. adjoin those of the Automobile Board of Trade and Mr. Metzger looked in that direction when he spoke. With the Selden patent out of the way, he said, the N. A. A. M. once more had taken its place as the "unquestioned head of the industry." He expressed the hope that his successor would be able to say at the end of his term that it is "the only association making claim to national importance or assuming to carry on the work for which the association was organized."

Among other things, President Metzger intimated quite plainly that the local shows had again reached the proportions of a nuisance, and declared that there is a growing sentiment in favor of a more effective control than is afforded by the rule requiring sanctions. He recommended the subject to the serious consideration of the new show committee.

Apart from the election of five members of the executive committee to succeed those whose terms of office had expired, the annual meeting was devoted chiefly to the rendering of the annual report. The executive committee itself, which elects the officers, will not hold its annual meet-

ing until January 27th. The five committeemen who were elected on Thursday are as follows: R. D. Chapin, Hudson Motor Car Co., Detroit; W. T. White, White Co., Cleveland; A. L. Pope, Pope Mfg. Co., Hartford, Conn.; Hugh Chalmers, Chalmers Motor Car Co., Detroit; G. W. Bennett, Overland Automobile Co., Toledo, Ohio.

Lending force to President Metzger's expressed opinion that one national organization is all that is necessary, in his report H. O. Smith, chairman of the show committee, brought out the facts regarding the lease of the new Grand Central Palace for show purposes, regarding which there had been some disagreement, and also indicated that hereafter the New York show will be held under the auspices of the N. A. A. M., as was the case before the Association of Licensed Automobile Manufacturers, or the Automobile Board of Trade, attained power. From what Mr. Smith said, it appears that the N. A. A. M. show committee, with the concurrence of the executive committee, was on the point of closing the lease for the Palace, when the Automobile Board of Trade "suggested that inasmuch as the support of that association would be necessary to the complete success of the show the lease ought to be in its name." Mr. Smith admits that "a lengthy discussion" ensued, but in the end the executive committee acquiesced or surrendered to the Board of Trade. Arrangements are under way however, which it is hoped will place the N. A. A. M. in control of the Palace and the Annex that will be erected during the present year, greatly increasing the capacity of the place and its usefulness for big shows.

The report of the commercial vehicle committee, of which S. D. Waldon is chairman, also developed one item of news, i. e., that the committee is framing the 90-day truck guarantee, which was drafted early last year so that it will "provide in some adequate measure for the two most serious difficulties in truck use—overloading and overspeeding." The committee is also seeking to establish a standard basis, by which truck chassis may be rated as to load-capacity and to provide an allowance in each different capacity for a standard body.

The report of the treasurer, W. R. Innis, disclosed that the receipts during the year were \$109,655.88, of which \$46,282.41 was brought forward. The two chief items of income were the Chicago show, with \$45,118.81, and dues and initiation fees, \$13,360. The disbursements amounted to \$32,338.99; the largest items were rent and salaries, which amounted to \$13,000 in round figures; fees and mileage, \$5,555.55; legal services, \$4,672. The sum of \$11,000 was expended in the form of appropriations, \$5,000 each to the American Automobile Association and the Good Roads Bureau, and \$1,000 to the Carriage Builders' Association.

DUNN REMAINS PRESIDENT OF M. A. M.

All Save One Officer Re-elected at Annual Meeting—Work of Credit and Finance Departments Emphasized.

For the next twelve months H. T. Dunn of the Fisk Rubber Co. will continue to guide the destinies of the Motor and Accessory Manufacturers. With a heartiness that was its own testimonial, he was elected to succeed himself at the annual meeting of the Board of Directors which occurred in New York on Friday last, 12th inst.

Excepting the first vice-president all of the other officers similarly succeeded themselves, James H. Foster, of the Hydraulic Pressed Steel Co., replacing Charles T. Byrne, of Byrne-Kingston & Co., as first vice-president, Mr. Byrne's other duties preventing him from serving another term. The officers retained were second vice-president, C. E. Whitney, of the Whitney Mfg. Co.; third vice-president, Claire L. Barnes, Claire L. Barnes & Co.; treasurer, H. W. Chapin, of Brown-Lipe Gear Co.; secretary and assistant treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co. The office of assistant treasurer is a new one which just has been created and Wainwright's election thereto was in the nature of adding to his duties as during the past year he had served as secretary. William M. Sweet, who has been connected with the organization for the past five years, was continued as manager.

At the annual general meeting of the Motor and Accessory Manufacturers, which occurred the previous Tuesday, three of the four three-year directors, whose terms expire, were retained in office as stated in the Motor World last week. They are H. T. Dunn, L. M. Wainwright and E. S. Fretz. The only new comer, F. C. Billings, of Billings & Spencer Co., succeeds F. E. Castle. Four new members were added to the roll at this same meeting on Tuesday, as follows: John L. G. Dykes Co., of Chicago; Cotta Transmission Co., Rockford, Ill.; American Bronze Co., Berwyn, Pa.; and the Detroit Lubricator Co., of Detroit, Mich.

After his re-election on Friday President Dunn appointed the following committees:

Executive Committee (created by the Board of Directors) consisting of the President, first Vice-President, and last retiring President.

Show and Allotment Committee—D. J. Post, chairman; E. E. Raymond, C. T. Byrne, James H. Foster, F. C. Billings.

Finance Committee—James H. Foster, chairman; H. E. Raymond, C. T. Byrne, W. H. Crosby.

Traffic Committee—D. J. Post, chairman; Claire L. Barnes, George Baus.

Membership Committee—L. M. Wain-

wright, chairman; C. E. Whitney, T. J. Wetzel.

At the general meeting which occurred on Friday, President Dunn rendered his annual report which clearly indicated the continued health of the organization. Its present membership is 251, as compared with 232 at the same period of last year. Thirty-two members were elected during the past twelve months and four were reinstated. By resignation or other wise 17 members were lost, making a net gain of 19. Several applications from concerns ineligible to membership were rejected. Incidentally a new amendment to the constitution was adopted which places additional restrictions on the qualifications for membership.

Despite the enlargement of the office and the office force, the M. A. M. has more money in its treasury than ever before—an amount in excess of \$80,000. All of the several departments have rendered good accounts of themselves. Of the membership of 251 there are now 218 co-operating with the credit department which during the year supplied upon request 5,222 reports containing credit experiences with 2,003 individuals or concerns engaged in the automobile industry. The finance committee composed of C. T. Byrne, H. E. Raymond, W. H. Crosby, J. H. Foster and President Dunn, comprises 207 co-operating members who individually had been furnished with 362 reports of credit information regarding 119 automobile manufacturers, making a total of 57,420 reports which have been issued during the year.

In the opinion of Mr. Dunn the finance department has not reached its limit of efficiency. Certain improvements which are in contemplation it is believed will add materially to its usefulness. The finance department, from its very nature, Mr. Dunn said, "is a very difficult and delicate one to handle." Great caution, he added, "must be exercised to avoid trade complications and conflicts with the letter and spirit of the law," but he believed that the department soon will assume still more important proportions, and that its work will result "in inestimable value and benefit" to the members of the M. A. M. In his report the president testified to the value of the co-operation rendered by his several official colleagues, and particularly "the conscientious and effective work of Manager Sweet. He also paid tribute to the "unselfish, loyal and intelligent efforts" and the "earnest, upright and honest life" of W. S. Gorton, the late treasurer of the M. A. M., who met death by accident on April 17th last.

Lauth-Juergens Planning Branch Factory.

It is not unlikely that the Lauth-Juergens Motor Car Co., of Fremont, Ohio, will locate a branch truck factory in Gibsonburg, in the same state. It is admitted that efforts to that end are in progress, and with excellent prospects that they will be brought to a head.

CASE PURCHASES LANSDEN TRUCK

Believed to be First Step in Absorption of Edison's Company by International—Capital Increased to \$1,000,000.

Interests represented by W. L. Case, of the Mack Motor Truck Co., of Allentown, Pa., have acquired the Lansden Co., of Newark, N. J., and Case is serving as general manager until the plans of the purchasers are more fully matured. The Mack company is controlled by the International Motor Co. at the time of whose recent organization it was said that the production of electric commercial vehicles ultimately would be included in its scope. Every indication therefore, points to the early absorption of the Lansden Co. by the International. Meanwhile the capital of the Lansden Co. has been increased from \$100,000 to \$1,000,000 and a new plant on Frelinghuysen avenue in Newark has been leased. The Lansden Co. formerly was owned by Thomas A. Edison, but several months ago Mr. Edison and Mr. Lansden fell apart and the latter resigned and with most of his staff joined the General Motors Truck Co. and developed the line of electric vehicles which that concern now is marketing in connection with its gasoline trucks.

Saurer Enforces a Carburetter Patent.

That the Holley carburetter, made by the Holley Bros. Co., of Detroit, is claimed to be an infringement of a patent owned by Adolph Saurer, the parent manufacturer of Saurer trucks, became known last week when a decree pro confesso was granted in favor of Saurer against the New York Sporting Goods Co., of New York, which had sold several Holley carburetters. The patent in question is No. 851,759, issued April 30, 1907, to one Anton Kunzel, of Switzerland, who assigned his rights to Saurer. The United States District Court for the Southern District of New York, in which action was instituted, granted the New York Sporting Goods Co. permission to dispose of the few Holley carburetters which it had on hand, the defendant, as stated, consenting to a decree pro confesso and also to payment of damages and costs, and to the issuance of a permanent injunction.

Court Reduces Fine Imposed on "League."

Having convinced Judge Lambert of the United States District Court in Buffalo that its violation of the court's injunction forbidding the sale of imitation Rajah spark plugs was unintentional, the International Automobile League, of Buffalo, has succeeded in having the penalty reduced. Although originally Judge Lambert held that A. C. Bidwell, president of the so-called league, had personal knowledge of at least one such sale and imposed on him personally

a fine of \$250, he has remitted that penalty and reduced the fine imposed on the corporation itself from \$1,000 to \$250, plus costs and disbursements. Bidwell, who to all intents and purposes is the International Automobile League, presented evidence which established in the mind of the court, that the sales of the counterfeit Rajah plugs was the "result of negligence and inattention to the situation as it existed."

Duryea's Old Company Changes Name.

The Duryea Auto Co., of Saginaw, Mich., which is capitalized at \$200,000, has changed its name to the Brooks Motor Wagon Co. The change is due to the recent internal upheaval in the Duryea company which led to the withdrawal of Charles E. Duryea, who retained the rights to manufacture pleasure cars under his patents, while the Brooks interests kept the rights to manufacture commercial vehicles under the same patents. C. C. Brooks, who has succeeded to the presidency and general management of the company, is a large manufacturer of "knockdown" furniture and boats. The other officers are: F. G. Palmerton, vice-president; J. O. Pierce, secretary and treasurer; R. S. Crawford, factory manager, and A. W. Morris, sales manager, who with Joseph Seeman and B. A. Brooks form the board of directors. The first Brooks wagon was displayed at the Grand Central Palace Show which closed last night.

Otto Engine Works Transfers Its Cars.

The Ottomobile Co., which has been incorporated under the laws of New Jersey with \$500,000 capital stock, has taken over the manufacture of cars and commercial vehicles formerly produced by the Otto Gas Engine Works of Philadelphia. The manufacture of the cars and trucks will be continued in Mount Holly, N. J., where it is stated a factory will be immediately erected. The officers of the new company are: Murrell Dobbins, of Philadelphia, president; William S. Jones, of Philadelphia, vice-president; T. D. Marren, of Mount Holly, treasurer; E. H. Ervin, of Philadelphia, secretary and general manager and W. S. Randall, of Mount Holly, director.

Prest-O-Lite to Leave Indianapolis.

Although it is possible that the general office may remain it is more than likely that the plants of the Prest-O-Lite will be removed from Indianapolis. Several cities are bidding for the plum which the Indianapolis Board of Trade is striving hard to retain, but as the Prest-O-Lite charging plant is by law forced to locate outside of the city of Indianapolis, and therefore is many miles removed from the tank factory such great expense is entailed in hauling and handling, that the Prest-O-Lite company has come to the conclusion that it is necessary that the two establishments be combined; as this is not possible in Indianapolis, removal to another city offers the only solution of the problem.

OLD TRADESMEN IN NEW PLACES

Some Resign and Many Climb to Higher Positions—Transfers Reported from All Parts of the Country.

Because of ill-health, J. J. Gormley has resigned the management of the Lozier branch in Boston. He has been succeeded by R. B. Nettleton.

William Bailey, formerly of the Gottschalk-Bailey Sales Co., of Chicago, has been appointed sales manager for the Briggs Magneto Co., of Elkhart, Ind.

J. Stewart Smith has been appointed sales manager for the Wohlfeld Trunk & Bag Co., of Philadelphia, Pa., which manufactures several luggage specialties for automobile use.

Herbert Lytle has been appointed manager of the branch of the Hupp Corporation just inaugurated in Kansas City, Mo. Both R-C-H gasoline cars and Hupp-Yeats electrics will be handled.

Frank T. Burrows has been appointed purchasing agent for the Briggs-Detroit Co. of Detroit. He had been associated with Claude S. Briggs, president of the company, and for several years in several other automobile enterprises in which Briggs had engaged.

O. H. Gray, manager of the Studebaker branch in Kansas City, has been transferred to the management of the retail branch of the Studebaker Corporation in Minneapolis. He will be attached to the northwestern sales department which is in charge of Charles R. Newby.

F. W. Cole, of San Francisco, has purchased an interest in the King Motor Car Co., of Detroit, and will assume the titles of assistant to president and director of sales. For the time being, however, he will remain on the Pacific Coast placing King agencies in that territory.

Berne Nadall has been appointed sales manager for the Cino Motor Car Co., of Cincinnati, Ohio, which will increase its output for 1912 to 500 cars, including a number of commercial vehicles. Previously Nadall was connected with the Findeisen & Kropf Mfg. Co., makers of the Rayfield carburetter.

John J. Rafter, president of the Newark Automobile Mfg. Co., of Newark, N. J., has resigned that office and retired from the company. W. A. Wood, of New York, has succeeded him as a member of the board of directors, but the presidency will be left open until the annual meeting of the stockholders which occurs January 25th.

Major B. Hawxhurst has been appointed manager of the lighting and ignition department of the Westinghouse Electric & Mfg. Co., of East Pittsburgh, Pa., and will have to do with the marketing of that company's new automobile lighting system.

Formerly Hawxhurst was Chicago representative for the Simms Magneto Co.

H. M. Swetland, president of the Class Journal Publishing Co., which publishes the *Automobile and the Motor Age*, has resigned that office and retired from active participation in the affairs of both papers, although he still remains a director of the company. Conde Nast, former vice-president, has been elected to fill the vacancy.

D. K. Moore, vice-president and one of the organizers of the American Distributing Co., of Jackson, Mich., has joined the Weston-Mott Co., of Flint, and has assumed the duties of general sales manager. Moore is one of the real veterans of the industry and during the past ten years has had to do with the production or sale of axles, transmissions and wheels.

Dave W. Henry, who assisted in organizing the Colby Motor Co., of Mason City, Iowa, and who served as its general manager since the beginning, has resigned that office and disposed of his holdings in the company, which recently was acquired by a party of Western capitalists. Henry, it is understood, shortly will go into business on his own account.

O. J. Woodward, who for some twelve years served the Diamond Ruber Co., first as manager of its New York branch and latterly as manager of the solid tire and wire department of the factory at Akron, has resigned that office to become sales manager of the Woods Motor Vehicle Co., of Chicago. This means, of course, that henceforth he will have to do with electric vehicles instead of tires, and his wide acquaintance will stand him to good purpose.

A. D. Plughoff has been promoted to the general management of the J. W. Leavitt Co., of San Francisco, which has the Pacific Coast representation for Overland and Kissel cars. Plughoff has been manager of the Leavitt branch in Los Angeles, and his promotion carries with it removal to San Francisco. While Leavitt himself retains the control and will keep a weather eye on the business, he will retire from the active management and "take things easy."

In addition to John H. Kelley, who was called from the management of the Republic Ruber Co.'s Chicago branch to assume the general sales management at the factory in Youngstown, Ohio, T. P. Best, New England manager for the company, also has been bidden to Youngstown headquarters, where he will serve as manager of mechanical sales. These changes were due largely to the illness of Vice-President Lomasney, who has been forced to relinquish his duties in order to seek health.

Weed Checkmates Atlas Grip's Move.

As the outcome of the suit for infringement of the Parsons non-skid patent instituted by the Weed Chain Tire Grip Co., on Thursday last, 11th inst., the United States District Court for the Southern District of New York issued a temporary in-

junction against the Atlas Chain Co. restraining the manufacture and sale of the Atlas chain tire grip. Two days later, Saturday, the 13th, the Atlas company appeared before Judge Hough and moved that the temporary injunction be set aside on the ground that its regular and established place of business is not located in the southern district of New York and that the suit properly should have been commenced in Brooklyn. It was brought out however, that the charter of the Atlas Chain Co. names the Borough of Manhattan as its principal place of business and accordingly the motion was denied and the case referred to Judge Lacombe for hearing on the motion for preliminary injunction. He will hear the case on the 26th inst., and meanwhile, at least, the temporary injunction remains in effect.

Nobby Treads Carried to Higher Court.

Despite the decision of the United States Circuit Court for the Southern District of New York that Morgan & Wright's "Nobby" tread tire is an infringement of the Tod patent, owned by the Republic Rubber Co., under which the latter manufactures its "Staggard" tread tire, the United States Tire Co., which controls Morgan & Wright, is not ready to admit the justice of the court's ruling. It has appealed to the United States Circuit Court of Appeals and pending the result of this appeal the court has ordered that the injunction in favor of the Republic Rubber Co. be suspended—which means, of course, that the production of Nobby tread tires will be continued until further notice without interruption.

Rose Institutes Twelve More Suits.

Pursuing its policy of instituting suits all along the line for infringement of the patents covering its Neverout lamp and license brackets, the Rose Mfg. Co., of Philadelphia, last week filed proceedings in the United States District Court for the Southern District of New York against twelve New York concerns, each of which it charges with infringement of the patents involved. These defendants are: Eclipse Specialty Co., Emil Grossman, National Sales Corporation, Gus Balzer Co., American Auto Supply Co., Lowe Motor Supply Co., J. Alexander Mfg. Co., John J. Tracey, George F. Connell, Universal Auto Supply Co., Automobile Surplus Stock Syndicate, and Jos. H. Parsons.

Fisk Intervenes in Taxicab Bankruptcy.

The bankruptcy proceedings against the Blue Taxicab Co., of Kansas City, Mo., were not permitted to reach the stage of summary auctioning off the property, as was demanded by some of the creditors. The Fisk Rubber Co., a creditor of the company for \$6,125.66, has filed an intervening petition, claiming that the assets of the taxicab concern are worth \$135,000, while the debts amount only to \$65,000, and asks that the receiver first be required to make

a report of the exact condition of the company, and that the court then order a sale of all assets for a sum not less than the upset price fixed by the court.

Wallof Truck Secures Plant in Red Wing.

The Wallof Motor Truck Co., of Minneapolis, has purchased from William Glardon a building in Red Wing, Minn., which will be converted into a motor truck plant. Glardon himself has acquired an interest in the truck company whose name probably will be changed to Red Wing Motor Truck Co. Little is known of the Wallof company, which is capitalized at \$200,000, the only names identified with it that have come to light being those of M. M. Sweet and A. G. Hinz. About a year ago it was stated that a plant probably would be located in Mankato, Minn., but the deal missed fire.

Bankrupt Matheson Causes Confusion.

The involuntary petition in bankruptcy, which recently was filed against the Matheson Co. of Boston, has led to the confusion of that concern with the branch maintained by the Matheson Automobile Co. at 664 Commonwealth avenue, Boston, which is not affected by or involved in the proceedings. According to Secretary Matheson, of the Matheson Automobile Co., the Matheson Co., of Boston, has been inactive and practically out of business for four years, and never had any connection with the present Matheson company.

Marsh Seeks a Factory Site in Ohio.

W. T. Marsh, president of the American Motor Co., which builds motorcycles in Brockton, Mass., but which has had a popular priced car up its sleeve for sometime, has almost, but not quite, concluded arrangement with the Lima Progressive Association, of Lima, Ohio, to locate in that city. If the deal goes through the new company will be styled the Lima Motor Car Co., and will manufacture a runabout styled the Lima Roadster which will sell for \$550.

Chicago Trade Associations Combine.

A merger was effected last week between the Automobile Trade Association of Chicago, and the Chicago Truck Dealers' Association, according to the terms of which the entire membership of the Truck Dealers' Association is taken into the Trade association, without having to join individually or to pay initiation fees. N. H. Van Sicklen, president of the Trade Association, remains president of the combined organization.

Reo Declares a 3 Per Cent. Dividend.

The Reo Motor Car Co., of Lansing, Mich., which at its annual meeting passed its dividend last week, declared a dividend of 3 per cent. of \$2,000,000. The money, it is stated, was derived from the 10 per cent. dividend recently declared by the Reo Motor Truck Co., the majority of whose stock is held by the Reo Motor Car Co.

COFFIN IS RE-ELECTED BY M. C. A.

**Continues as President for Another Year—
Riker Becomes Vice-President—Mem-
bership Increased to 93.**

Following the trend of the times the Manufacturers Contest Association, Inc., at its annual meeting in New York on Friday last, 12th inst., continued in office all but one of its incumbent officials, as follows: President, Howard E. Coffin, Hudson Motor Car Co.; vice-president, A. L. Riker, Locomobile Co. of America; secretary-treasurer, E. R. Hollander, Fiat Automobile Co., and Russell A. Field, assistant secretary-treasurer. Mr. Riker was the only newcomer in the list of officers.

The board of directors for 1912 consists of Messrs. Coffin, Riker and Hollander, with the addition of George M. Dickson, National Motor Vehicle Co., and C. A. Emise, Lozier Motor Co. Howard Marmon, Nordyke & Marmon Co., will continue as chairman of the rules committee until his successor is decided on. The Advisory Committee to the Contest Board of the American Automobile Association, consisting of S. A. Miles, representing the National Association of Automobile Manufacturers, H. F. Bonnell, representing the Automobile Board of Trade, and Jesse Froehlich, representing the importers, was re-elected.

Reports of officers and committees were read, showing the association to be in most flourishing condition. The membership was increased during the year from 39 to 93 members, and a campaign is in contemplation, which it is believed will result in the enrollment of practically every car manufacturer in the country. The treasurer reported a substantial balance.

Three More Dyer Patent Suits Filed.

Three more suits have been filed by Leonard H. Dyer in the United States District Court for the Southern District of New York for the alleged infringement of the Dyer sliding gear patents, Nos. 885,986 and 921,863. They are directed against the Commercial Motor Car Co., and its managers, Arthur J. Slade and Frederick A. Rumpf; William M. Paul, a garage owner, and Louis Pittsburgh, all residents of New York City. Paul recently purchased a much-used Selden car for a very low price and is assumed to be one of the many car owners on whom Dyer is "serving notice"; not a few of whom already have found it convenient to pay the \$25 "license fee" which is the price of peace.

Federal Truck Purchases Larger Factory.

The Federal Motor Truck Co., of Detroit, has purchased the plant in that city formerly operated by the Van Dyke Motor Car Co., which got into financial difficulties before it fairly started. The real es-

tate acquired is 200 x 800 feet on which stands a main factory building, 60 x 512 feet, and also warehouses, test sheds and a power plant. The Federal company already has taken possession, and is now engaged in removing its machinery from its old plant. The new establishment will permit of an output of at least 1,000 trucks per year.

Quick Action in Klaxon-Ever Ready Case.

There were none of the proverbial "law's delays" connected with the suit of the Lovell-McConnell Mfg. Co., of Newark, N. J., against the American Ever Ready Co., of New York, for infringement of seven of the patents covering the Klaxon Horn and for unfair competition. Motion in the case was filed December 28th last, it was heard on January 5th and on the 15th Judge Hough, in the United States District Court for the Southern District of New York, rendered a decision that the Ever Ready motor driven horn is so much like the type L-Klaxon "that it must be a very little distance indeed within which anyone can distinguish the Klaxon horn from a Ever Ready." Accordingly he directed that an injunction be issued "restraining defendant from using complainants characteristic right angle construction."

Lamp Bracket Basis of \$50,000 Suit.

Claiming that the R. E. Dietz Co., of New York City, is manufacturing and marketing a lamp bracket, infringing patent No. 919,837, issued on April 27, 1909, to the DuBois Safety Lamp Co., the latter company has instituted a suit for \$50,000 damages in the United States District Court for the Southern District of New York. In addition to the damages it asks for the usual accounting and a permanent injunction. In its answer to the bill of complaint the Dietz company claims that the patent is invalid, that it had been antedated by 13 United States and two English patents, and that the same lamp bracket has been and is being used by the Rushmore Dynamo Works, of Plainfield, N. J., and others.

Chicago Again May Possess Tire Plant.

George D. Dryden, president of the Dryden Hoof Pad Co., of Chicago, has purchased a site in that city at the southwest corner of Forty-third street and Baltimore & Ohio Chicago Terminal Transfer Railway tracks on which he purposes erecting a plant for the manufacture of pneumatic and solid rubber tires. The plant will comprise about 60,000 square feet, and will have a capacity of about 200 tires per day. If Dryden carries out his intention, Chicago will have a tire factory for the first time since Morgan & Wright removed to Detroit.

Empire Top Voluntarily "Folds Up."

A petition in voluntary bankruptcy has been filed by the Empire Top & Wind Shield Co., of Boston, Mass. Its liabilities are \$1,199 and its assets \$322.

COVER LICENSE DID NOT PROTECT

**Allen Auto Specialty Brings Suit Against
Alleged Infringer of Nathan Patent—
Validity of Patent Challenged.**

Whether or not the patent No. 799,662, issued September 19, 1905, to Benjamin Nathan for improvements in automobile tire covers, is a valid patent will be decided by the United States District Court for the Southern District of New York, as a result of a suit brought by the Allen Auto Specialty Co., against the Niagara Auto Cover Co., of New York City, for infringement, and which involves a somewhat unusual feature. It appears that in November, 1908, Nathan sold his rights to William A. Allen, and the latter on August 23, 1911, transferred these rights to the Allen Auto Specialty Co., but in its answer to the complaint the Niagara company sets up that in 1906 it applied to Nathan for a license to make and sell a type of automobile tire cover, which it had been making for some time, and which appeared to be closely similar to the one on which Nathan received the patent. This license, it claims, was granted and a number of covers since have been manufactured and sold. When the patent rights were assigned to the Allen company, however, the latter notified the defendant of its intention to bring suit for infringement, and the Niagara company asserts that it promptly desisted from making the alleged infringing covers. Now, that the suit actually has been instituted however, the Niagara company proposes to fight the validity of the patent, and to this purpose cites no less than 21 patents said to antedate the Allen-Nathan patent, No. 799,662. The suit has been placed on the calendar for argument on the first Monday of next month.

Lindell to Fight Bankruptcy Action.

A petition in involuntary bankruptcy has been filed against the Lindell Motor & Auto Parts Mfg. Co., 3444 Lindell avenue, St. Louis, Mo., by four of its creditors whose claims aggregate \$2,600. The company is prepared to fight the bankruptcy proceedings, claiming that the petition is the result of a disagreement among the stockholders and that the company is solvent. It is incorporated with a capital of \$6,000.

Stromberg Takes Title to Its Factory.

The Stromberg Motor Devices Co., of Chicago, has purchased the seven-story factory building at Twenty-fifth street and Michigan avenue, in which the Stromberg carburetter has been manufactured, and which has been occupied under lease for the past year. The building is a concrete-steel structure occupying a plot 61 x 101 feet.

QUAKERS START TWO-WEEKS SHOW

**Cars Now Hold Boards in Two Armories—
Trucks Next Week—Italy and France
Form Show Picture.**

With the usual amount of pomp and glamor attendant upon such occasions, the eleventh annual Philadelphia automobile show was inaugurated on Saturday evening last, January 13th, and will continue until January 27, pleasure cars being the drawing cars for the first week, and commercial vehicles the second. The exhibits, owing to the lack of quarters sufficiently large to accommodate the full complement of space renters as a unit, as was the case last year, divided between the First and Third Regiment Armories.

This division serves at least one purpose—it permits the transportation of keen imaginations from the clear blue skies and turquoise waters of sunny Southern Italy, which are depicted in a scene embracing the Bay of Naples and vicinity, including a distant view of Mount Vesuvius—which scene forms the basis of the decorative scheme, in vogue in the First Regiment Armory—to the famous Forest of Fontainebleau in France, depicted in the panels which adorn the walls of the Third Regiment drill room.

The scheme followed out in partitioning off the allotted space was adopted with the object of keeping clear and unobstructed the view of the artists' handiwork, the end being attained by suspending from the ceiling girders, the signs designating the different makes of motor cars, instead of placing them on top of numerous poles or posts, as is the usual custom in other cities.

There were many vacant spaces on the opening night; for quite a few of the pleasure cars scheduled to be on view, were still in New York. When the doors were opened on Monday morning however, the full complement of each of the "57 varieties" was on view.

Among the manufacturers and dealers who are exhibiting are: Abbott-Detroit Motor Co., Abbott-Detroit; Automobile Co., of Philadelphia, Marmon; Automobile Sales Corporation, Peerless and Cadillac; L. J. Bergdoll Motor Co., Bergdoll; Cartercar Motor Co., Cartercar; Chadwick Engineering Works, Chadwick; Chalmers-Hipple Motor Co., Chalmers; Colt-Stratton Co., Cole; Continental Motor Car Co., Speedwell; W. Wayne Davis Co., Everitt; Eldredge Co., Garford; Fiat Automobile Co., Fiat; Ford Motor Co., Ford; Foss-Hughes Co., Pierce-Arrow; G. H. Ganter; Stearns; Gawthorpe & Wister, Elmore and Brush; General Motor Car Co., Lozier; Gomeroy-Schwartz Motor Car Co., Hudson; D. Walter Harper, Case; Hupp Corporation, R. C. H.; Imperial Automobile

Co., Imperial; Thomas B. Jeffery & Co., Rambler; E. C. Johnson Co., Reo and American; Johnson Motor Car Co., Haynes; Locomobile Company of America, Locomobile; Longstreth Motor Car Co., Alco; Matheson Automobile Co., Matheson; Mercer Automobile Co., Mercer; Mitchell-Lewis Motor Co., Mitchell; Motors Distributing Co., Kisselkar; North Philadelphia Automobile Station, Knox; Oakland Company of Pennsylvania, Oakland; Oldsmobile Company of Pennsylvania, Oldsmobile; Overland Motor Co., Overland; Packard Motor Car Co., Packard; Paxton-Crumley Automobile Co., Warren and Marquette; Pope-Hartford Sales Corporation, Pope-Hartford; A. G. Spaulding & Bros., Stevens-Duryea; Standard Motor Car Co., Velie; Stanley Motor Carriage Co., Stanley; Seltzer & McCowan, Firestone-Columbus; Stoddard-Dayton Automobile Co., Stoddard-Dayton; Studebaker Brothers Co., E-M-F and Flanders; Tioga Automobile Co., National, Hupmobile and Nyberg; United Motor Philadelphia Co., Maxwell and Columbia; The White Co., White; Winton Motor Carriage Co., Winton.

Premier and A. A. A. Again at Peace.

H. O. Smith and the Premier Motor Mfg. Co., of Indianapolis, of which he is president, and the American Automobile Association have kissed and made up. Since the memorable rumpus which followed the award of the Glidden trophy in 1910, in which Chalmers's protest was sustained and the Glidden trophy taken from the Premier entry, the Premier people and the A. A. A. have not been on speaking terms, Smith, and the Premier company having been disqualified and suspended indefinitely by the A. A. A. Contest Board for appealing to the courts in an effort to recover the famous cup. On Thursday last, however, peace was declared and Smith and the Premier company were reinstated to good standing by the A. A. A. Contest Board, which met on that date at New York.

Utica Dealers Form an Association.

The Utica Automobile Trades Association has been formed by the dealers in automobiles and accessories in Utica, N. Y., with the following officers: President, H. D. Gouse; vice-president, A. A. Ledermann; secretary, W. F. Carroll; treasurer, A. H. Westcott. In addition to these officers the board of directors includes F. P. Miller, Charles H. Childs and E. A. Wilmoughby.

Grinnell's Sales Manager Stricken at Show.

Henry Goodman, general sales manager for the Grinnell Electric Car Co., of Detroit, who was in attendance at the Grinnell exhibit at the Madison Square Garden show last week, was stricken with pneumonia on Saturday and is now confined to his home in New York. It probably will be at least three weeks before he is able to get about again.

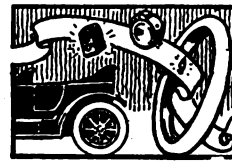
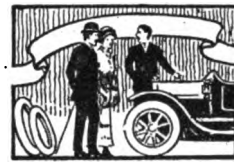
MILWAUKEE HAS EVEN GARDEN WALL

**Employs Pleasing Decorative Scheme for
Its Annual Show—275 Cars and Trucks
Displayed to Advantage.**

Beneath a flood of electric lights, radiating down upon the highly polished cars and chassis, the annual show of the Milwaukee Automobile Dealers' Association opened in the Auditorium on Saturday night last, 13th inst., and will continue until the end of this week. There are 275 cars and trucks in evidence, filling all the available space.

The decorative scheme is well worked out. Beyond the columned entrance stretch the gracefully winding paths of a southern colonial garden, effectively edged with denim turf. Clusters of plants all abloom, and arranged in symmetrical plots, add relief. Surrounding all, at the edge of the arena, is an ivy-covered wall.

The exhibitors and the cars they display are as follows: Abresch Co., Chas., Abresch truck; American Automobile Co., Pierce-Arrow; American Locomotive Co., Alco truck; Auburn Auto Garage, Auburn; Brodessa Motor Truck Co., Brodessa truck; Buick Motor Co., Buick; Bates-Odenbrett Automobile Co., Abbott-Detroit, Krit, White truck; George W. Browne, Overland, Marmon; Case Threshing Machine Co., J. I., Case truck; Crown Commercial Car Co., Crown; Curtis Automobile Co., Reo; Emil Estberg, Pope-Hartford, Woods electric; Franklin Auto and Supply Co., Regal, Franklin; Gas Power Engineering Co., Premier; Hickman-Lauson-Diener Co., Ford; Hughes, Orrin R. Garford, Everitt, Hustis Bros., King; T. B. Jeffrey Co., Rambler; Johnson Service Co., Johnson; Jonas Automobile Co., Cadillac; Kisselkar Co., Kisselkar; Kopmeier Motor Car Co., Chalmers, Fiat, and Detroit and Flanders electrics; E. B. Leverenz, Elmore; Lozier Motor Sales Co., Lozier; Marx Bros., Union; McDuffee Automobile Co., Stoddard-Dayton, Chase truck; Menhall, Jos. H., Brush; Michigan Motor Sales Co., Michigan; Milwaukee Electric Railway and Light Co., Rauch & Lang, electrics; Jay E. Morehouse, Cole, Hupmobile; Motor Truck Service Co., United States truck; Obenberger & Sons Co., Monitor; Packard Motor Car Co., Packard; Peerless Motor Car Co., Peerless; R. D. Rockstead, Warren, Paige-Detroit; Edgar F. Sanger Co., Maxwell, Stearns; Schreiber Motor Car Co., Locomobile, Haynes, Hudson; Smith-Hoppe Auto Co., Hupp-Yeats electric; Stegman Motor Car Co., Stegman; Studebaker Corporation, Studebaker electric, landers, E-M-F; Arthur F. Tiegs, Imperial, Tuschen Bros., Nyberg; Universal Machinery Co., Progress truck; Velie Motor Car Co., Velie; Henry Walter, Staver; Winton Motor Carriage Co., Winton.



A. F. Lauzon & Co., are building a garage in Burlington, Vt., at 160 South Winooski avenue.

Lester Lund has opened a garage and salesroom in Nashua, N. H., where he will handle the Rambler line.

H. O. McGee has opened salesrooms in Indianapolis, Ind., where he will display Everitt and Stoddard-Dayton cars.

The Plymouth Auto Co., of Lemars, Ia., has been sold to Feddle & Klemme, who will continue under the same style.

Judge F. W. Jenkins, of Chippewa Falls, Wis., has entered the automobile business and opened salesrooms, he will handle the Mitchell line.

F. & W. Baysinger have purchased the Philip building on East Camden street, Salisbury, Mass.; a garage and repair shop will be installed.

Irwin T. Donohoe has opened an accessories store at 1803 M street N. W., Washington, D. C.; he will handle Prowodnick tires and accessories of all kinds.

The Henderson-Cole Motor Co. has been incorporated in Texas, for the distribution of Cole cars in Dallas. Its salesrooms are located at 2025 Commerce street.

C. O. Kittleson has purchased a lot adjoining the Anderson Hotel, Forest City, Ia., on which to build a garage. It will be 50 x 132 feet, of steel and concrete.

Albert S. Borden and L. Deloss Bragg, who did business under the style Chadakoin Garage Co., in Buffalo, N. Y., have filed a voluntary petition in bankruptcy.

Joseph Ray, who for several years has been conducting a garage in Defiance, Ia., has sold out to Byron Iseminger and H. E. Haines. They will take possession on the 1st of March.

Bert E. Brown and H. S. Burnap have formed a company in Davenport, Iowa, under the style the B. & B. Auto Co., with a capital of \$10,000. They are preparing to open a garage.

The Andregg Motor Car Co., has purchased the Klein building on Front street, Guttenberg, Ia., in which it will open a garage as soon as the necessary alterations are completed.

W. R. Allen, Paul Bethel and Paul H. Hester, have formed a partnership and opened a garage in Covington, Ky. A large repair shop is to be run in connection with the establishment.

Tollef Erickson, who with J. H. Schlitz composed the Rochester Motor Co., in the Minnesota town of that name, has sold out to his partner. The business will go on under the old style.

Under the style Holmes Garage, a new establishment has "opened up" in Gaffney, S. C., at Meadow and Limestone streets. B. A. Holmes and Perry Z. Holmes are the men behind the enterprise.

The American Motor Sales Co. has opened up at 4914 Delmar avenue, St. Louis, Mo. As the name indicates the company will sell American cars, under the guidance of Clem T. Strauss, president.

Hess & Meyers, who are the agents for Ohio cars at Toronto, Can., are building a garage on Richmond street, between King and Queen streets. The structure will be three stories high, 50 x 150 feet.

Jake Dunfield and Buzz Welch have taken over the automobile stage business of W. A. Shaklin and associates. The company operates a number of motor stages between Colusa and Williams, Cal.

A. M. Whaylen and Carl Hollingsworth have consolidated their respective salesrooms and established themselves in the old Hollingsworth garage, in Reinbeck, Ia. They sell Cadillac and Overland cars.

Dr. I. Clendenen, a physician of Jacksonville, Fla., has retired from medical practice to engage in the automobile business. He has opened salesrooms in the Florida city, where he will display Auburn cars.

The Motor Shop, which was incorporated last month in Indianapolis, has taken over the business of Cecil E. Gibson and the Fisher-Gibson Co. Hoover Holton is president and general manager of the concern.

E. A. Ramsey, who conducts a livery business at Little Rock, Ark., has added automobiles to his other business and opened a garage on Maple street. He will conduct a general repair and renting service.

C. U. Whiffen has purchased an interest in the Appel-Burwell Tire & Accessory Co., of Dallas, Tex., and will become manager of the sales department. H. Appel, the senior partner, retires in order to take up other work.

The Stutz Motor Car Co., of Wisconsin, is the style of a new concern which has "opened up" in Milwaukee, Wis., under the management of Edward F. Arlington. As the name signifies, Stutz cars will be handled exclusively.

C. S. Chamberlain, president of the Colorado Motor Sales Co., of Denver, has heard the "call of the farm" and quit the automobile business. The company which handled Peerless and Marmon cars last week wound up its business.

The White Motors Co. has been formed at Kansas City for the purpose of selling

White pleasure cars. The company's salesrooms are at 1616 Grand street; Herbert D. Ellinwood, formerly with the Dey-Embryo Motor Co., is manager.

Clyde Easton, of Herscher, Ill., has purchased a half interest in the Kankakee Motor Co., in the Illinois town of that name, from its owner, H. L. Mann. The garage and supply business will be continued under the old name.

The E. A. Hammer Co. has been incorporated at Cleveland, Ohio, to take over the accessory business of Hammer & Hull, 1839 Euclid avenue. H. L. Hewett, who for twelve years has been with Collister & Sayle, is secretary-manager of the reorganized company.

The Champlain Garage Co. has been organized in Rutland, Vt., with a capital of \$10,000, to operate a garage and renting service. A building 56 x 167 feet is being erected for the company at 181 St. Paul street; it will be under the management of G. A. Collison.

The Ellis Motor Car Co., of Newark, N. J., has moved into more commodious salesrooms at Central avenue, between New and Second streets, where a complete service building has been erected for its own exclusive use. The company handles the Pierce-Arrow line.

The Locomobile Co. of America, has leased for the term of eight years the property at the corner of Beatty and St. Clair streets, Pittsburgh, Pa., and will establish therein a distributing branch which will cover western Pennsylvania, western New York, Ohio and West Virginia.

E. S. Youse has purchased the interest of his partner Samuel H. Daddow, in the Youse & Daddow Co., which operates a garage at 120 Madison avenue, and a salesroom at 46 North Fifth street, Reading, Pa. He will continue the business under the style the E. S. Youse Co., and will handle Chalmers, Thomas, E-M-F and Flanders cars, as well as manufacture the "Perfect" brand of specialties and accessories.

Recent Losses by Fire.

Jeffersonville, Va.—Frank Start's garage and one car destroyed. Loss, \$4,500.

Cincinnati, Ohio—Emil Pollack's garage, 2648 Stanton avenue, burned. Loss, \$4,000.

Cedar Rapids, Ia.—F. Vavra & Co.'s garage, 305 Fifth avenue, destroyed. Loss, \$5,000.

Buffalo, N. Y.—William P. Northrup's garage, 80 Jewett avenue, destroyed by explosion of water heater. Loss, \$5,000.

MOST NOTABLE OF M. A. M. BANQUETS

And Once More Col. George Pope Rouses the Banquettters While a Detroit Amazes Them.

If any feature of the Motor and Accessory Manufacturers' fourth annual banquet, which occurred at the Waldorf-Astoria on Thursday evening last, 11th inst., stood out more prominently than any other one feature, Col. George Pope constituted that feature. "Colonel George," as usually he is affectionately called, is chairman of the Automobile Board of Trade's show committee, which implies that he is more directly interested in the manufacture of motor cars than of the accessories that go with them. But for all of that he has a grip on the accessory men.

There is that about the "good, gray colonel" which twangs the heart-strings. Always cordial, always genial, always unaffectedly affable and sincere, he can smoothe wrinkles and soothe ruffled feelings and win friends in a fashion not given to many men. They all know him and they all just can't help liking him. His appearance at the M. A. M. banquet last year marked its climax, and the same is true of last Friday's function. "Colonel George" was one of the speakers, but it was not so much what he said, or how he said it that three cheers, standing, were called for and given with a will. It was that affection, that grip which the colonel has on the heart of his fellows.

The banquet itself was notable, undoubtedly the most notable ever held by the M. A. M., and possibly the most notable ever held by any organization identified with the industry. Certainly in point of numbers, it was a whale of an affair. Fifty-three tables were set at each of which there was an average of eight diners, so that the assemblage represented well over 400 good fellows. Almost everyone who is anyone in the accessory trade was present. Indeed, the printed seated schedule resembled a directory of the trade. The menu itself was in keeping with the hospitality in which it was served. The music was good, and there was much of it. It was of a tuneful sort in which those who had voices and cared to do so, might join.

There were few speakers, and all save three of them were trained speakers; two were professional wits whose business it is to add to the merriment of such occasions. The toast master was James Clarence Harvey, the playwright, and he played well his part. He was gracefully introduced by H. T. Dunn, president of the Motor and Accessory Manufacturers, and forthwith delivered a poem on "Bohemia," of which goodfellowship was the keynote.

The toastmaster in turn presented W. E. Metzger, president of the National As-

sociation of Automobile Manufacturers, whom he introduced as "a self-starter." Mr. Metzger spoke of the close relations which have always existed between the M. A. M. and the N. A. A. M., and hoped and predicted that they would become even closer. J. Hartley Manners, another playwright, followed Mr. Metzger. Beauty was the burden of his song. Playwrights and automobile manufacturers, he declared, are working along the same lines. Authors, he said, strive to present beauty and motor cars gave them beauty by carrying them to it. Cresswell MacLaughlin, billed "The Schoolmaster," obliged with a flow of humor, and a series of facial expressions.

Colonel George Pope came next, and it was then that the assembly forgot playwrights, and humorists, and professional speakers, and gave to the veteran chairman of the show committee, one of those spontaneous receptions that make the world seem all sunshine and rosehues. In his address "Colonel George" dealt lightly with reminiscence and remarked the benefits that came of a fine, harmonious show, and of the good results that had followed, not only the present show, but all the licensed shows, and other shows, and other things which had gone before.

When the three cheers and the enthusiasm accorded Colonel Pope fully had subsided, James Schermerhorn, publisher of the Detroit Times, who has a reputation as a sparkling speaker, let fall a train of epigrammatic utterances. Among other things, he asserted that parts are better than the whole—not accepting the automobile parts business. Tiring of epigrams, Mr. Schermerhorn somewhat amazed and mystified his hearers by launching into what appeared to be a boost for Woodrow Wilson for the presidency of the United States. None were looking for remarks of the sort and not everyone relished them. Indeed, there were those who appeared inclined to resent the injection of such a subject and some there were who declared that they detected more than one hiss. When Mr. Schermerhorn had concluded, the vaudevillians appeared on the scene, and amused the assemblage for more than an hour.

Hess-Pontiac Ousts Axles For Springs.

The Hess-Pontiac Spring and Axle Co., of Pontiac, Mich., has discontinued the manufacture of axles and henceforth will devote itself solely to the production of springs. The decision naturally will provide more room and permit of a larger output of the vanadium automobile springs on which the Hess company specializes.

10 Per Cent. for Croxton-Keeton Creditors.

The trustee in bankruptcy of the Croxton-Keeton Motor Car Co., of Massillon, Ohio, has declared a ten per cent. dividend and applied to the Court for authority to disburse it to the creditors. He also has filed his second accounting which shows a balance of \$58,505.

TOLEDO SETS SHOW IN A GARDEN

At Any Rate Flowers and Smilax and Settees Contribute a Garden Effect—Local Trade is Well Represented.

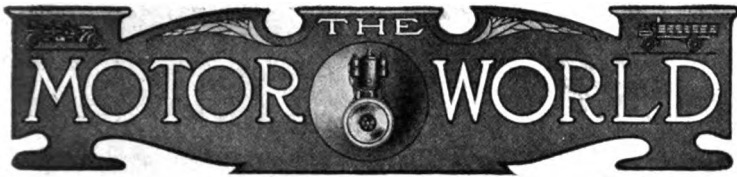
As the doors of the Terminal Building in Toledo swung open promptly at 7:30 P. M. on Monday evening last, the 15th of January, there was disclosed to the entering populace, bent on attending the third annual show of the Toledo Automobile Dealers' Association, a transplanted Venetian garden studded with motor accessories. Cars themselves were not discernible, until, after having traversed the entryway in which are housed the 25 accessory exhibitors, the main hall was reached.

Artificial roses entwined with southern smilax form a canopy over the entire exhibit, the green carpet blending with the numerous palms distributed around the rooms, tending to carry out the garden effect produced by the numerous appropriate panel pictures distributed around the hall, the whole setting being made more realistic by the addition of wicker seats.

Among the exhibitors are: Atwood Automobile Co., Overland, Marmon, Waverley and Garford cars, and Garford, G. M. C. and Federal trucks; The Auto Exchange, Regal; H. J. Adams, Reo; Banting Machine Co., Paterson, Grabowsky truck, Blevins Auto Sales Co., Flanders, E-M-F, and Gramm trucks; Bowersex Motor Sales Co., Everett; Crist-Motor Sales Co., Cole; Clyde Motor Sales Co., Elmore; Ford Bros. Auto Sales Co., second-hand cars; Gracet Motor Co., Hupmobile Warren-Detroit, Lauth-Juergens trucks; Home of the Mitchell, Mitchell; John Johns, Zimmerman; James P. Locke, Adams truck; John Lauer, American; Litchie Automobile Co., Cadillac; Motor Car Sales Co., Abbott Detroit; Marathan-Toledo Sales Agency, Marathan; Michigan Buggy Co., Michigan Buggy Cars; McCreery Mfg. Co., Oliver trucks; Merrill Co., Kelly trucks; Northern Ohio Motor Car Co., Metz, Paige-Detroit, Brush; Rambler Motor Sales Co., Rambler, Detroit electric; Robert-Toledo Auto Co., Ford; Stoddard-Toledo Co., Stoddard-Dayton; Stearns Hupp-Yeats Sales Agency, Stearns, Hupp-Yeats, R. C. H.; Toledo Motor Sales Co., Hudson, Krit; United Garage Co., Knox; United Motor-Toledo Co., Maxwell, Sampson, Columbia; Union Supply Co., Pierce-Arrow, Chalmers; White Co., White.

Willys Becomes New York Bank Official.

John N. Willys, president of the Willys-Overland Co., of Toledo, Ohio, has been elected vice-president of the Chelsea Exchange Bank, of New York City, and thereby entered metropolitan banking circles. He succeeds A. E. Stilger who was elevated to the presidency of the bank.



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IMPROVING THE CONDITIONS OF TRUCK DRIVERS.

While the development of the commercial vehicle is constant and rapid; while transportation systems generally are being improved in every possible direction; and while schools are being established for the enlightenment of motor truck drivers in order that they may more efficiently serve their employers—while all these things are being done for the benefit of owners of motor trucks, there is one subject that is deserving of far more serious consideration than is usually accorded it, viz., the protection of the driver from the weather.

To admire the hardihood of the men who sit, sometimes for hours on end, at the wheels of slow-moving vehicles, or to come to the soothing conclusion that "they don't mind it because they are accustomed to it" is one thing; to do what the drivers do, and to keep on doing it all the year around, regardless of the weather, is quite another. It is a difficult matter for the driver of a touring car, wrapped in furs and protected to some extent by the closed front of his car, to keep even fairly comfortable; it is an impossible thing for the truck driver, perched in an exposed position and not always too well provided with appropriate clothing.

Almost any motor truck can be fitted with a cab with windows, completely enclosing the driver's seat and affording real protection. The cost of such an arrangement is not excessive; in fact, it bears a very small proportion to the cost of the machine itself. And it requires only a little knowledge of trucking conditions as they actually are to bring the realization that the investment is bound to pay handsome interest, at the very least. Practically every driver of a motor truck who works in really trying weather,

stands it as long as he can or cares to, and then retreats to some place where he can get warm—within and without—and the place almost invariably is a saloon. The time wasted in this way really is more than it actually seems to be, and amounts to a good deal in the course of a week or a month. Add to this the risk incurred in leaving the machine unwatched, and, again, add the bad effect of breaking in on the driver's work, and the evils that can be eliminated by the use of a driver's cab become apparent.

Another improvement that is beneficial to the owner of the truck, to the driver and to other users of the roads, is left-hand steering, which is coming into more general use every day—doubtless because it involves no extra expense and also because trucks are designed for use in heavy traffic, and the left-hand position enables the driver to use his eyes and hands to better advantage. Sitting on the left-hand side of his car, the driver is placed to see how his machine is positioned with relation to vehicles he is passing, and to make his calculations accordingly; he is in a more favorable position for observation when overtaking and passing other vehicles, and also when being overtaken and passed or when about to change direction. The central position for the levers makes entrance easy from either side, and the right hand, trained to handle the gears and brake, is still used for that purpose.

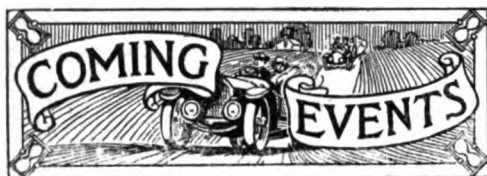
In short, the adoption of these two features—a cab for the driver and left-hand steering with center control—would go far to make life bearable for the motor truck driver, while the truck owner might reasonably look for financial returns from the investment.

ADDING TO THE CONVENIENCE OF MOTORING.

One of the tendencies emphasized by the automobile shows, and which has been developing for some time, though slowly, is toward the provision of suitable storage for the tools, tires and spare parts of the motor car and the personal effects of the motorist. There are indications of a growing recognition among manufacturers of the fact that there are few things more disagreeable than the necessity for disturbing passengers while the seat cushions are removed, the covers lifted and a miscellaneous mass of material raked over until the desired article is found, and as a result the present inclination is to provide really adequate receptacles so located as to be truly accessible, regardless of whether such storage compartments are concealed or not. The inclination should become general. It will add greater convenience to motoring and will be appreciated by all who ever have put up with the old order of things.

A different application of a kindred principle is found in the tendency, also of slow growth, to equip cars with instruments for indicating the quality of gasoline, oil and electricity available. It does not seem to be in line with the general refinement that has taken place in the mechanism of motor cars that the driver should be in ignorance of the quantity of gasoline or oil in the tanks or the state of his batteries supplying ignition or lighting current, without resorting to more or less crude methods of informing himself—such as poking a stick into the gasoline tank to ascertain the depth of the liquid—and while there are certain mechanical difficulties that must be removed before all that is desired can be accomplished, the difficulties are not serious.

There seems to be no good reason why the driver of a car should be required to leave his seat to perform any of the functions necessary for the handling of the machine, or to satisfy himself as to his fuel, oil and current supplies.



January 13-19, Milwaukee, Wis.—Milwaukee Automobile Dealers' Association's annual show in Auditorium.

January 13-27, Philadelphia, Pa.—Philadelphia Automobile Trade Association's annual show in First and Third Regiment Armories.

January 15-20, Toledo, Ohio—Toledo Automobile Dealers' Association's annual show in Terminal Railway Building.

January 15-20, New York City—Automobile Board of Trade's 12th annual national show in Madison Square Garden. Commercial vehicles only.

January 18-20, New York City—Annual meeting of the Society of Automobile Engineers.

January 22-27, Providence, R. I.—Rhode Island Licensed Automobile Dealers' Association's show in the State Armory.

January 22-27, Rochester, N. Y.—Rochester Automobile Dealers' show in State Armory.

January 22-29, Detroit, Mich.—Detroit Automobile Dealers' Association's annual show in Wayne Garden.

January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

January 29-February 3, Scranton, Pa.—Second annual automobile show in 13th Regiment Armory.

February 1-7, Washington, D. C.—Annual show in Convention Hall.

February 3-10, Montreal, Can.—Automobile Club of Canada's annual show at Drill Hall.

February 3-10, Harrisburg, Pa.—Harrisburg Automobile Dealers' Association's third annual show in Harrisburg Arena.

February 5-10, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of commercial vehicles.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

February 5-17, St. Louis, Mo.—Annual show in the Coliseum.

February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.

February 14-17, Grand Rapids, Mich.—Third annual show.

February 17-24, Cleveland, Ohio—Cleveland Automobile Show Company's annual show in Central Armory.

February 17-24, Newark, N. J.—New Jersey Automobile Exhibition Co.'s annual show in First Regiment Armory.

February 17-24, Minneapolis, Minn.—Minneapolis Automobile Show Association's annual display at National Guard Armory and Coliseum.

February 19-24, Omaha, Neb.—Omaha Automobile Association's annual show in the Auditorium.

February 19-24, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show of pleasure cars in Music Hall.

Punished For "Stock Car" Advertising.

For advertising the performance of the two Abbott-Detroit cars which competed in the last Vanderbilt Cup Race, held at Savannah, November 27th, 1911, as being stock cars, the Abbott Motor Car Co., of Detroit, Mich., and the Abbott-Detroit Motor Co., of New York, have been disqualified by the A. A. A. Contest Board, and suspended for six months, or until July 11th, 1912. Rule 75 (a) of the A. A. A. Contest Rules prohibits the advertisement of the performance of a car as being the performance of a "stock" car unless such performance is made in an event regularly sanctioned for and open only to registered stock cars or stock chassis. The 1911 Vanderbilt Cup Race was run under the rules and with the sanction of the A. A. A. as a Class "C" Non-Stock event, and was open to any motor car with a piston displacement of between 301 and 600 cubic inches, whose manufacturer had, within the preceding twelve months produced at least 50 cars. The Vanderbilt Cup Race is not restricted to stock cars and no technical examination is made by the A. A. A. Technical Committee of cars competing in Class "C" events to ascertain whether they check up with the sworn and approved complete technical specifications on file with the Contest Board, as is required under the Contest Rules in those events which are open only to stock cars or stock chassis.



Chicago, Ill.—Hart Motor Car Co., under Illinois laws, with \$10,000 capital; to deal in automobiles. Corporators—Fred P. Hart, Karl Byington, Charles G. Stohrer.

Covington, Ohio—Kentucky Motor Car Co., under Ohio laws, with \$20,000 capital; to do a garage business. Corporators—Paul H. Hesser, Paul L. Bethel, William R. Allen.

Chrisman, Ill.—Rayfield Motor Co., under Illinois laws, with \$75,000 capital; to manufacture and deal in automobiles. Corporators—Fred K. Thayer, Albert E. Schnitker, E. E. Staley.

Oskaloosa, Ia.—Anderson Bros. Auto Co., under Iowa laws, with \$50,000 capital; to deal in automobiles and accessories. Corporators—Charles H. Anderson, F. M. Anderson and others.

Lansing, Mich.—Buick Auto Sales Co., under Michigan laws, with \$5,500 capital; to deal in automobiles and accessories. Corporators—Fred S. Hughes, Julius La Bonte, William H. Martineau.

Cleveland, Ohio—Hammer & Hull Co., under Ohio laws, with \$10,000 capital; to deal in automobile supplies. Corporators—J. Bushea, J. Miller, C. Murman, W. J. Mahon, E. A. Hammer.

St. Louis, Mo.—Electric Garage and Service Co., under Missouri laws, with \$2,000 capital; to sell electric automobiles and supplies. Corporators—Milton B. Strauss, Clarence Irvin and others.

Indianapolis, Ind.—International Pneumatic Wheel Co., under Indiana laws, with \$100,000 capital; to manufacture automobile wheels. Corporators—W. H. Alford, W. S. Johnson, R. R. Dennis.

Burlington, Vt.—Champlain Garage Co., under Vermont laws, with \$10,000 capital; to do a general garage business. Corporators—Dr. H. B. Watkins, L. W. Welch, Clarence Morgan, G. A. Collison.

Chicago, Ill.—Excelsior Manufacturing and Supply Co., under Illinois laws, with \$500,000 capital; to deal in automobiles and motorcycles. Corporators—Ambrose A. Worsley, Marx Lochwin, Samuel W. Jackson.

Toledo, Ohio.—Buckeye Auto Service Co., under Ohio laws, with \$5,000 capital; to do a general delivery and trucking business. Corporators—Fred H. Kirtley, Trude Wooster, Aaron B. Cohn, Vada C. Southard and Harry Beeman.

Grand Rapids, Mich.—The Robert Willey Automobile Co., under Michigan laws, with \$25,000 capital; to deal in automobiles and accessories. Corporators—Robert A. Willey, Alson F. Willey, Willis C. Root, Erwin L. Quackenbush, Henry Blankfort.



Palace Show Proved Industry's Progress

Cars and Trucks Displayed in Handsome Setting Demonstrated That Little Makers, and Big, Have Heeded Lessons of Experience—Improvement Apparent All Along the Line—"Freak" Vehicles and Freak Accessories Few and Far Between.

Undoubtedly there is room for argument, but that the National Association of Automobile Manufacturers' show in New York which closed last night, 17th inst., after a week's run, is about the handsomest exhibition of the sort that ever has been held anywhere, is an opinion that will withstand a great deal of prodding. It was the first show held in the new Grand Central Palace, and that building is so unlike the old Palace in which some other shows were staged that the transition was as from darkness to light. The new structure is truly worthy of its name.

At the show just terminated there was not a great deal of that decoration which of late years has become associated with automobile shows. All the others had far more red and gold and green and purple and yellow tints, and bunting of as many hues, but the Palace required few patches from Jacob's coat to make it pleasing to the eye. Unadorned it is imposing—almost magnificent. The grand stairway which leads to the exhibition hall is truly a grand stairway. It is of marble; so too are the majestic Corinthian columns which form the central court. Everywhere the ceiling is high, and lights are numerous enough and bright enough to rival the sun. All is white and bright, and cheerful. True, for the purposes of a display of industrial wares, such as motor cars and motor trucks, the great circular arena with its surrounding galleries, is lacking in the Palace. But above the main hall there are two floors from which the central court, or "well" may be viewed. They are half-hid from the main floor, however, and no such effect is possible as is obtained in Madison Square Garden and the Chicago Coliseum. Though great wide stairways lead to these upper floors the exhibits there are almost displays apart. Up there too, the ceilings are high, the aisles are wide, the lights are bright, and there is whiteness. Such paint-

ed embellishment as existed in the Palace was unobtrusive, but in rare good taste so modest, perhaps, that not many showgoers paused to obtain the effect, but the effect, nevertheless, was obtainable. The light touch of the decorative hand has imparted the effect as of looking outward from a great magnificent white palace into depths of autumn woodland, autumn being, perhaps, the keynote of the decorative scheme. There were giant palms at the head of the grand stairway. There were woodland scenes in the arched panels formed by the contour of the four walls of the main hall, and so well had the artist obtained "distance" that viewed from afar, or from above, it was possible to see far into woodland retreats, rich in reds and golds, and the other tints of autumn.

In the central court there is one particularly wide panel in which the chief painting was displayed—the painting of a pair of centaurs fighting the approach of the modern motor car. It was apart from, and yet a part of the autumn scheme. All windows were draped with soft, green curtains, and on all floors the signs bearing the names of exhibitors were dull green with raised gold lettering. Above those exhibits which occupy private places in the central court—the Rambler, the Hupmobile, the Cole, the Stutz, and the Firestone-Columbus—the signs were suspended by dull green chains.

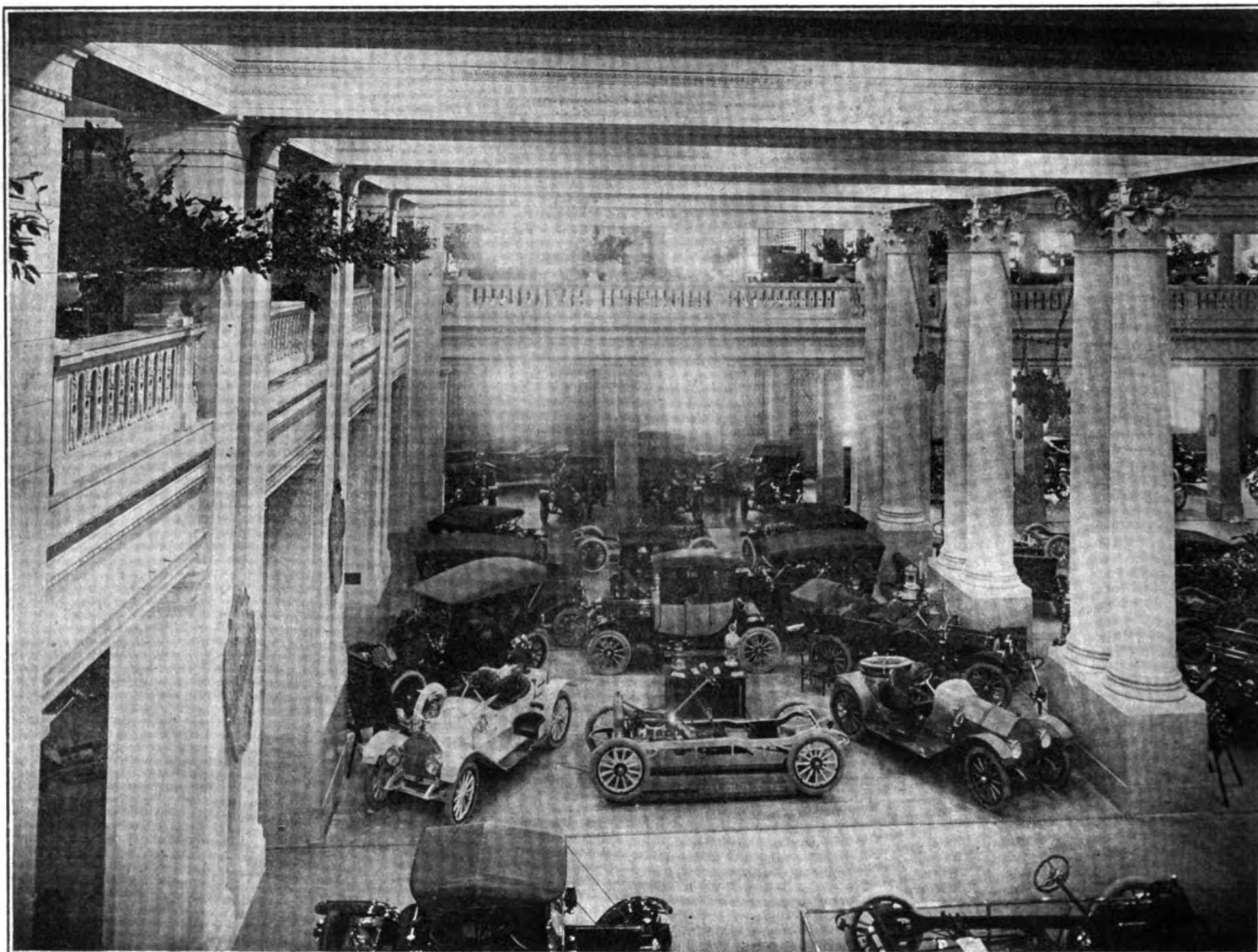
Upstairs one viewed faint suggestions of autumn woodland through painted lattice-work on the walls. On the balustrade of the second floor, overlooking the central court were many huge urns aflame with scarlet poinsettias. On the third floor only a glimpse of the main hall could be had as the balcony which overlooks it had been filled in with green trellis, entwined with autumn foliage and flowers.

Though disagreement may exist, it is fair to say that the whole effect was

superbly eye-pleasing. There was nothing which was garish or glaring, but much that was quiet, artistic and refined.

The pleasure cars were located in the main floor with here and there a stray truck intervening. The second floor was given up to commercial vehicles, but not wholly, for there were several pleasure cars also in evidence, usually in connection with the truck exhibits of the same manufacturer. The third floor was devoted wholly to accessories, the display of which was not particularly bountiful. In fact, it was rather meager, and not a few of the exhibits were practically duplicates of those made by the same exhibitors at the Madison Square Garden Show. The tire manufacturers were the most conspicuous exhibitors, and as always their carpeted spaces and cushioned seats were the most inviting. Here was room to spare on all sides, however, and many more exhibits could have been placed. All of which implies that there was no lack of elbow room; indeed no one's elbows were bruised or barked by contact with other elbows during the week, for if the whole truth be told there never was a time when anything suggestive of a real jam of humanity was present in the Palace. The attendance was fair—passing fair; that's all. There was none of the crowding or jostling, or congestion that marked the first week of the Garden show.

The majority of the exhibitors were from the West and in both cars and trucks there was evidence of that breeziness—that freedom from conventionality which is associated with the western country; but as a while, the productions, both Western and Eastern, were much improved articles. They looked bigger and much better than ever before. Also the colors were much quieter. There was but one "fire alarm red" in the whole show. There were few "show cars." There were several white cars, one of which,



CENTRAL COURT AND A GLIMPSE OF THE SECOND FLOOR—COLE CARS IN FOREGROUND

a Cole, was set off by three white doves perched one each on the side lamps and the radiator cap, and there was an Abbott-Detroit of what was styled the "Artillery" type—a chunky, little two-passenger car finished in battleship gray, and edged all around with exposed rivets; also there was a Hupp-Yeats electric coach, gold trimmed and with its interior in rich, handsome red, all of which came near to being "show cars"—almost, but not quite. Undoubtedly the showiest thing in the whole show was a chassis of the Lippard-Stewart truck, every nut and bolt of which and every other part of which was finished in pure gold leaf. There was not a very great showing of silverware—of those trophies of the track and road, which betoken a car's prowess. The Abbott-Detroit exhibit included several pieces of silver, and apparently to show that not all the silverware belongs to the speed cars, the makers of the Kelly truck displayed several cups which had fallen to their lot as the result of slower and more peaceful and prosaic contests.

From a purely mechanical point of view, the Palace show was even more conspicu-

ous for the absence of radicalism than was the Garden array of pleasure cars. There were Knight engines at the Garden but not even a Knight engine, or any other radically different mechanism was disclosed at the Palace, excepting only the Church external compression engine, but even this is not new, strictly speaking, for it was exhibited last year at the Chicago show. More than ever was standardization of design apparent. Practically every manufacturer has made small alterations—"refinement of detail" it is styled—and there are few who have not added at least one new model, but on the whole construction differs only slightly from that which was disclosed a year ago.

There was one feature which stands out in marked contrast to the exhibition at the Garden, however, and this was the considerably greater number of cars of the closed front variety which were minus the usual skuttle dash. To the practiced observer of progress it almost appeared that the wave of closed front popularity had just reached some parts of the West and that in its travel it had dropped some of the sugges-

tion of finish which has reached to other parts and which was amply evidenced at the Garden exhibit. Be that as it may, however, the fact remains that skuttle dash cars were fewer and farther between than they were at the other show.

Another of the conspicuous features was the added equipment which now is specified as standard by many manufacturers. At the Garden it was to be expected that equipment would have been made considerably more complete for the simple reason that the average price of the cars displayed was higher than it was at the Palace. As every one knows, the Palace show was largely a show of moderate and even low priced cars, which serves to emphasize the increasing liberality of manufacturers. Cars which heretofore have been innocent of such equipment as electric lighting systems and engine starters now have them—in many cases both of them—and other cars hitherto marketed almost stripped now are fitted out with equipment which is so complete as to require merely that the gasoline and oil tanks be filled when they are ready to be driven a mile or a thousand



ANOTHER VIEW SHOWING THE MAGNIFICENCE OF THE CENTRAL COURT

miles. And all of this without material increase in the initial cost of the car; in some cases the prices listed for the corresponding last year's models are even higher than for this year's more completely equipped cars.

Individual cars differ as to the construction of their essential parts, of course, just as they always have and just as they always will; each has its exclusive features and, as is the case with so many other things, it is not possible to generalize very greatly; it is necessary to place each exhibit under the microscope separately in order to bring to light its particular "high spots" or exclusiveness.

Rambler Cars—Power Range, 38—50;
Price Range, \$1,600—\$2,850.

Those who have not had opportunity to view the Rambler line since last it was shown in New York several years ago, would have difficulty in recognizing it in the form in which it now is presented, so little does it resemble its forebears. As a matter of fact, it has changed not a little

in the last twelvemonth, and has pushed even higher up the scale. The characteristic and exclusive spare wheel equipment which occupied a prominent place on the running-board of all the various models and has served as a certain means of identification has been relegated to the comparative obscurity of the rear of the bodies, and this change in itself is sufficient to alter the appearance of the cars considerably. Also it no longer is supplied as standard equipment.

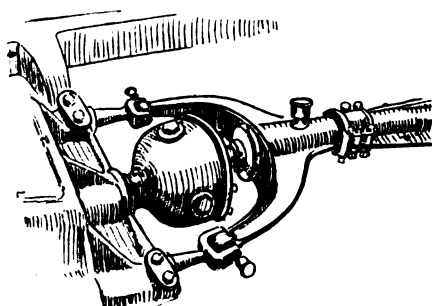
As has been the policy heretofore, but two chassis sizes are included in the line and each is equipped with a four-cylinder motor; the smaller of the two is rated at 38-horsepower and the larger at 50-horsepower. On these two chassis, however, there are mounted no less than 11 distinct body styles ranging from the conventional touring bodies to a Sedan limousine and an impressive double limousine of the Berlin type. The body styles almost revolutionize the Rambler's appearance. Names, too, instead of numbers, now are used to designate the different models. Mechanic-

ally, the two chassis have changed but slightly, and still embody the same general types of motor, the same distinctive expanding-band clutch, selectively operated change gear mechanisms and semi-floating rear axles. Cylinder dimensions in each case have been increased slightly and now are $4\frac{1}{2} \times 4\frac{1}{2}$ in the 39-horsepower motor and $5 \times 5\frac{1}{2}$ in the larger model. The force feed lubricator which heretofore has been located at the left side of the chassis in proximity to the flywheel has been moved forward and now occupies a place between the magneto and the water pump, a single straight-through shaft serving to operate all three. Slight improvements in the method of attaching the gear shift lever to the gearset have been made so that the pull on the lever is more directly transmitted. A new radiator of the former shape, but of lighter construction, has been adopted and the hub caps also have been changed slightly. Wheelbases, too, have figured in the general revision, and now are 120 inches in all of the 38-horsepower models, and in two of the 50-horsepower

cars, and in the remaining 50-horsepower models it is 128 inches.

Fiat Cars—Power Range, 35—50; Price Range, \$4,500—\$5,500.

There are few examples of block motor casting that elicit more genuine exclamations of admiration than the new six-cylinder Fiat which just has been added to the line. Six-cylinder block motors are scarce enough to cause comment anyway, but Fiat productions always have been noted for the incorporation of exceptionally clever examples of block casting, and if for no other reason are of sufficient interest to warrant more than passing attention. But there are other features of interest as well and prominent among them is the great simplicity and solidity which is apparent in both the four- and six-cylinder models which are displayed. The "six" of course attracts the most, for the simple reason that it is the latest product from the American factories of this world-famous Italian manufacturer. Strictly speaking, it is practically an enlargement of the four-cylinder model which preceded it but a short time, though it has been improved here and there and the construction differs slightly in some respects.



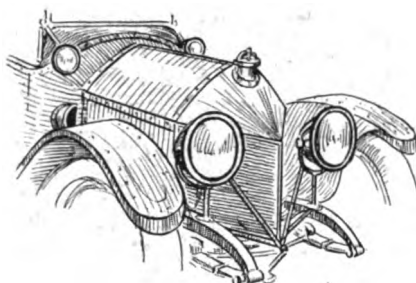
FIAT TORQUE TUBE SUPPORT

The new car is rated at 50 horsepower, the cylinders measuring the same as those in the four-cylinder 35-horsepower model, namely, $4\frac{3}{4}$ inches bore and 6 inches stroke; it is, therefore, of the long-stroke type, which construction constantly has been advocated by the manufacturers for several years past. The location of the pump and magneto at the extremities of a transverse shaft at the front of the cylinder casting is unusual and adds materially to the general air of simplicity which is a feature of the whole engine. The driving shaft is worm driven from the back of one of the gears in the timing gear train, the gears themselves being of the helical type, one of bronze and the other of steel. But a single deviation from previous practice, as exemplified in the four-cylinder chassis, has been made in the new model, and this concerns the location of the service brakes. On the smaller model they are located on the propeller shaft, but on the 50-horsepower chassis they are located on the rear wheels. The clutch and change gear mechanism are the same, the former being of the multiple disk variety, completely housed and running in an oil bath, and the latter providing

four speeds ahead and reverse, selectively obtained. A single body style is exhibited on the six-cylinder chassis, and this is a roomy seven-passenger touring body, beautifully finished and equipped, as becomes the product of a manufacturer who has gained an international reputation for excellence of workmanship.

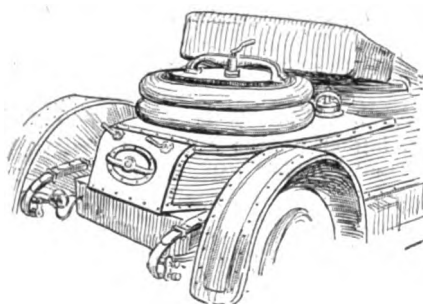
Abbott-Detroit Cars—Power Range 30—44; Price Range—\$1,275—\$3,000.

There are very few cars staged at the Palace that rightly may be termed unusual,



ABBOTT-DETROIT "ARTILLERY" TYPE

but of the few a compartment roadster of Abbott-Detroit make, which bears no outward resemblance to other members of its immediate family, is undoubtedly the most unusual. In the first place it has a V-shaped radiator which suggests speed possibilities and at the same time lends an unmistakable foreign appearance, though few foreign cars ever presented the distinctive appearance of this typical American product. It suggests in every line a bulldog or torpedo-boat destroyer. The body is of metal, painted battleship gray, and the presence of rows of rivets at the edges, and where joints are made gives an added touch of distinction which is further increased by



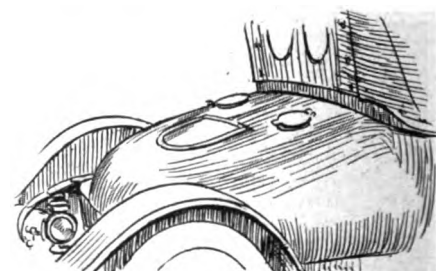
ABBOTT FROM THE REAR

massive bright steel spiders which hold the radiator cap and other filler caps in place. At the back, the body slides are carried up nearly straight to meet a flat top on which are carried spare rims and tires. Though the whole effect is one of great solidity and strength the actual weight of the car, it is said, is not nearly as great as might be expected. The body is mounted on a new size of chassis, which but recently has been added to the line, and though it is new throughout it reveals all the earmarks which have contributed to Abbott fame. The new chassis is styled model 44, and is equipped with a motor nominally rated a 40-horsepower and measuring $4\frac{1}{2}$

inches bore, and $5\frac{1}{2}$ inches stroke; the motor, clutch and change gear mechanism are a single unit. The same type of dry multiple disk clutch which has operated to such perfection in the 30-horsepower models is retained for the "44" and the gear set also is quite similar, and permits three speeds forward and reverse. Both sets or brakes in the new model are located on the rear wheels, though the transmission service brake is retained as a feature of the smaller cars. As a matter of fact there has been very little change made in the 30-horsepower models, the manufacturers being content to continue them in practically the original form for the simple reason that experience has proven that alterations of a radical nature are unnecessary. Practically the only changes which have been made include an enlargement of the bore of the motor from four inches to $4\frac{1}{8}$ inches, the stroke remaining $4\frac{1}{4}$ inches, the re-location of the spark plugs over the valves and a slight alteration of the disks in the clutch so that they are thinner than heretofore. A new line of bodies has been added, of course, to fit the larger chassis.

Marion Cars—Power Range, 30—50; Price Range, \$1,150—\$1,850.

Although the Marion line still embraces



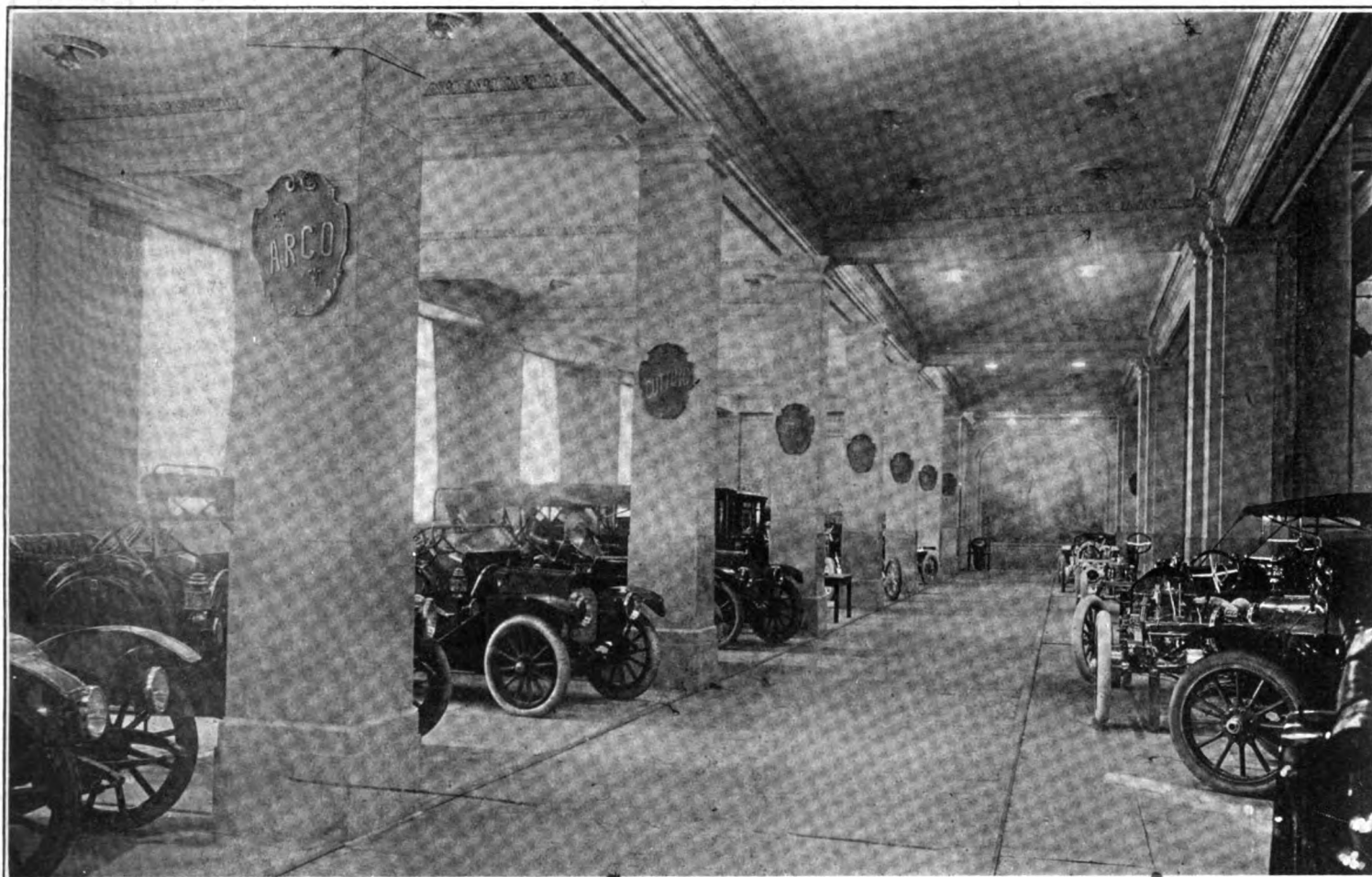
REAR OF MARION ROADSTER

three chassis, two of which are equipped with 30-horsepower motors and differ but slightly from the previous light cars in the assortment, the third chassis has been practically redesigned in conformity with the new 45-horsepower motor with which it is equipped. Although many of the excellent mechanical features which in the past have contributed materially to the Marion reputation have been retained, a number of new characteristics have been added, and as has been previously stated the motor itself is entirely new throughout. Cylinders are cast in pairs with the valves all on the same side and the dimensions which are $4\frac{1}{8}$ inches bore and $5\frac{1}{2}$ inches stroke, reflect the current tendency toward greater stroke-bore ratios. In the construction of the motor particular attention has been given the desirability of silence and to this end great care has been given the obviating of sources of lost motion and "slap." Other salient points of the chassis included in the transmission elements embrace a leather-faced cone clutch of large diameter, a three-speed selectively-operated gear set and a full-floating double-trussed

Timken rear axle. Three body styles are regularly supplied on the new chassis and these include an enclosed body roadster with the gasoline tank at the rear, a four and five-passenger, closed-front touring car. Another roadster of the popular compartment type also is furnished and one of these that is exhibited never fails to attract more than the usual amount of attention. The body is finished in black and the rear compartment is sloped down in a graceful curve nearly to the chassis frame.

been made of course, and though they scarcely are worthy of note individually, collectively they have increased efficiency and dependability, and placed the line on an even higher plane than ever before. The "six" is new all the way through and is powered with a long stroke motor, the dimensions of which are $4\frac{1}{8}$ inches bore and $5\frac{1}{4}$ inches stroke; cylinders are individually cast and the valves are all on the same side. A dry plate multiple disk clutch is used and power is transmitted to full-floating

of value. The motor is of the long-stroke type, the cylinder dimensions being $3\frac{3}{4}$ and 5 inches respectively, while the motor bearings are noticeable in being extra large and die-cast of nickel-bronze. As in the smaller models, the unit power plant is employed and the various details of plant, gear set, drive, axles, etc., are similar with the exception of being on a scale suitable to their increased power of the car. The wheelbase is 122 inches, and the body on either touring or roadster type is very



ONE OF THE SIDE AISLES ON MAIN FLOOR—WOODLAND VISTA IN THE DISTANCE

Both gasoline and oil tanks of liberal size are enclosed in the compartment, with the filler caps outside, and in addition there is ample room for the storing of tools, spare parts and side curtains.

Auburn Cars—Power Range, 30—50; Price Range, \$1,100—\$3,000.

By the addition of a new six-cylinder 50-horsepower model which reflects the character and sturdiness that have marked the other Auburns, this interesting line has been broadened and now includes four sizes of chassis on which are mounted bodies in great variety. The three older chassis, which all mount four-cylinder motors of 30, 35 and 40-horsepower, respectively, have sustained but little alteration beyond the adoption of full-floating rear axles in place of the semi-floating members that have been used heretofore. Slight alterations have

rear axles through a three-speed selectively operated change gear mechanism. A single model of the new size is exhibited, and it is an exceptionally roomy seven-passenger touring car tastefully finished in maroon and black relieved by nickel-plated trimmings. As a matter of fact, all the other cars in the line now have nickel trimmings instead of brass as heretofore, and needless to say, bodies have been improved in contour as well as in other respects calculated to increase the comfort of passengers.

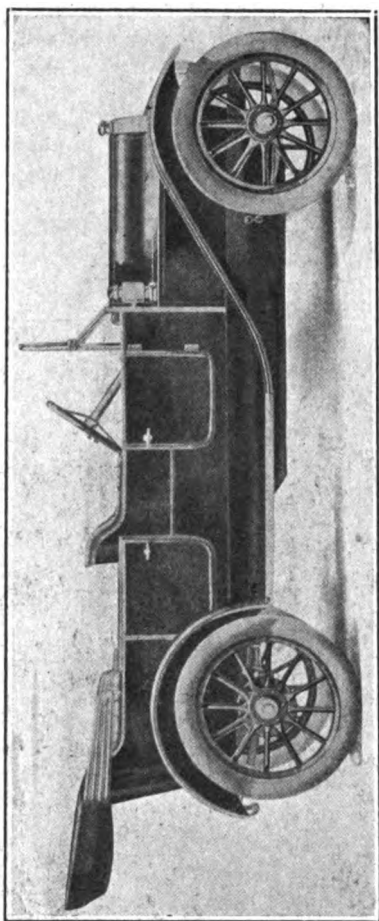
Havers Cars—Power Range, 31—44; Price Range, \$1,500—\$1,800.

With a larger six, rated at 44-horsepower, in touring and roadster models, added to the 31-horsepower "six" the Havers line, at the prices which prevail, is one that few who incline to six-cylinder cars, can well permit to escape consideration; it is full

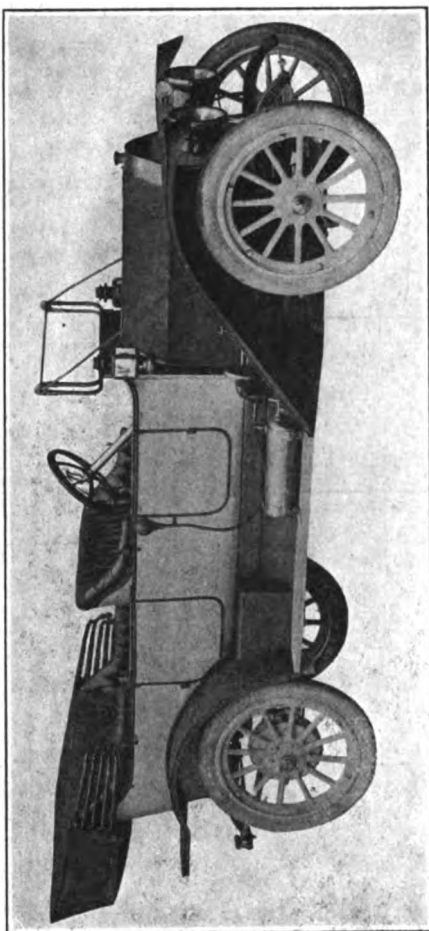
roomy and comfortable, with excellent protection from dust and draughts in both rear and front seats. The control levers are all inside. Baker "bolted-on" rims of the demountable type are standard fittings and an acetylene self-starter is part of the regular equipment.

Herreshoff Cars—All of 25-Horsepower; Price Range, \$900—\$1,500.

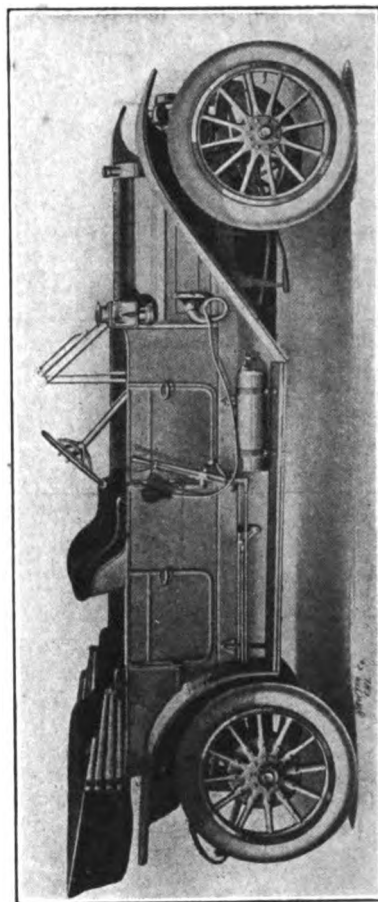
Associated as it is with the building of many of America's most noted racing yachts, it is natural that the Herreshoff car should exhibit a fineness of finish and that careful attention to details which has made the yachts famous the world over and which always has characterized these cars in the moderate-priced, moderate-powered class. Aside from this, however, the car itself possesses a sufficient number of distinctive features to cause it to attract attention any-



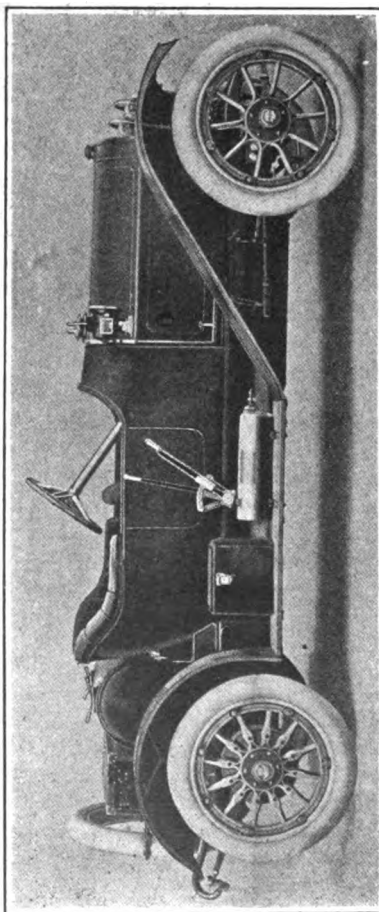
THE MICHIGAN "33" IN FIVE-PASSENGER TOURING FORM



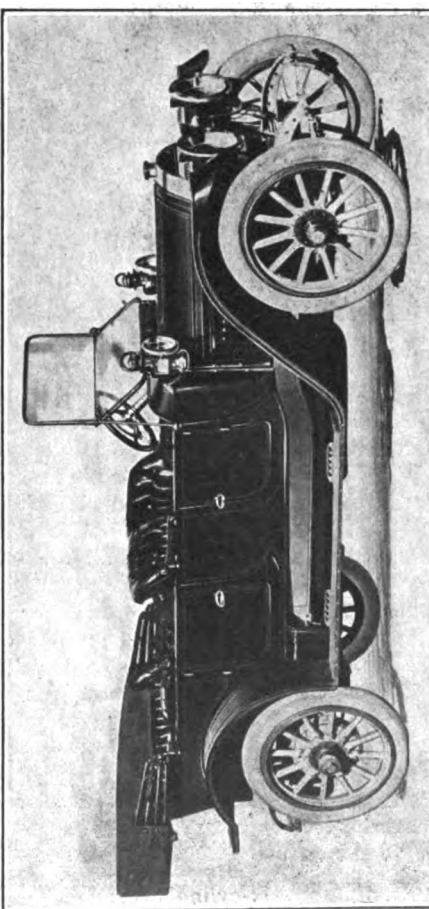
FIVE-PASSENGER CLOSED-FRONT WESTCOTT TOURING CAR



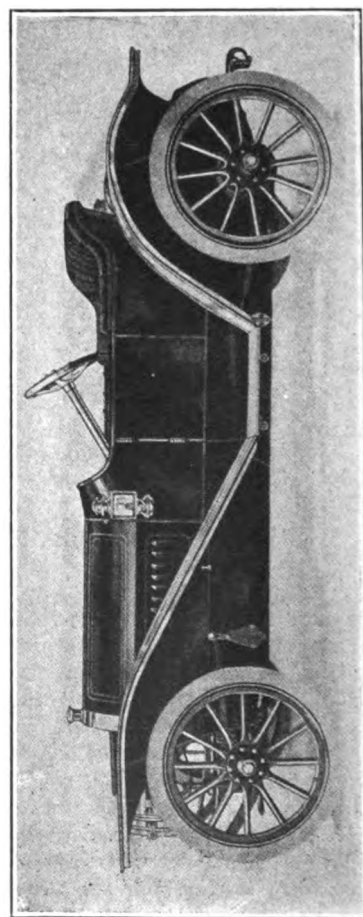
THE OTTOMOBILE IN SMALL TONNEAU FORM



STUTZ ENCLOSED ROADSTER WHICH LISTS AT \$2,000



STUYVESANT 50-HORSEPOWER SEVEN-PASSENGER TOURING CAR



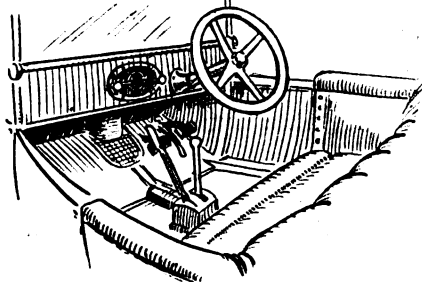
THE \$900 REGAL "25" UNDERSLUNG ROADSTER

where. Not the least of these is the interchangeability of roadster and coupe bodies, either of which may be put on or taken off the chassis quite easily and in a very short time. As a matter of fact the operation is so simple that the manufacturers specialize on this feature and supply both bodies and the chassis at \$1,500, the purchaser thus obtaining virtually two cars for the price of one. The coupe is exhibited, together with a four-passenger touring car, and that it makes an undeniable appeal, particularly to the fair sex, is evidenced by the crowd that throngs the exhibit from morning till night. Structurally, the chassis has been changed considerably, the visible alteration embracing the elimination of the emergency brake lever and the substitution of a pedal to take its place and the shifting of the control levers to the center of the footboard. The service brakes are operated by means of the clutch pedal and the emergency brake pedal is equipped with a ratchet stop to hold the brakes set when necessary. Plain bearings, instead of ball bearings, now are used in the motor and a three-speed selectively operated change gear mechanism has been substituted for the progressive type that was used last year. Slight changes have been made in the bodies and equipment has been made more complete by the addition of electric lights, operated by a storage battery, a top and a wind-shield.

Hupmobiles—Power Range, 20—32; Price Range, \$750—1,100.

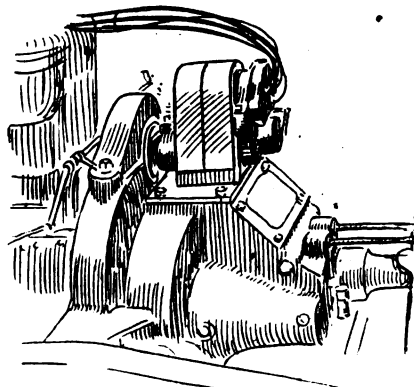
Of the smaller cars, rated in the neighborhood of 30-horsepower, and with prices not far from the \$1,000 mark, the Hupmobile is one of the most talked of in the Palace. When the 20-horsepower runabout model was brought out it created considerable talk which was augmented by the appearance of a touring car model, and now that the line has been increased by the addition of a larger model rated at 32-horsepower and embracing not a few features which heretofore have been considered impossible of application to car listing at less than \$1,000 it is safe to say that a real disturbance has been created. The 20-horsepower model which was the first car listing at \$750 to be equipped with a four-cylinder block motor, Bosch ignition and sliding gears is continued practically without change. The 32-horsepower model is a brand new car right through from start to finish, of course, though in its production the manufacturers have profited by their experience in the building of the smaller car and have utilized several of its distinctive features. Thus, the motor clutch and change gear set are enclosed in a single housing, though each element differs materially from previous practice as exemplified in the smaller models. The cylinders of the new motor measure $3\frac{1}{4} \times 5\frac{1}{2}$ inches and the latest engineering practice is reflected in the driving of the camshaft and the magneto by means of a chain of the

"silent" type. The magneto itself is mounted at the back of the engine on top of the flywheel housing. Lubrication of the motor is forced feed through a hollow crankshaft, the camshaft driving chain being lubricated from the crankcase. Three speeds instead of two are provided in the change gear set and this mechanism too receives the same lubrication as the motor,



HUPMOBILE DASH ARRANGEMENT

one system serving for both. Another variance from previous practice as exemplified in the smaller models lies in the use of full-floating rear axles instead of semi-floating. By an ingenious arrangement of the axles, it might be added, adjustment from the outside is made a simple matter. Other essential features which differ from those in the 20-horsepower model embrace the use of an irreversible type of steering gear, variable magneto timing, non-adjustable Zenith carburetter, a new type of honeycomb radiator and a belt driven fan. Externally, the several body styles which are supplied on the new chassis differ radically from anything which heretofore has borne the Hupmobile name-plate. Bodies are all



HUPMOBILE MAGNETO LOCATION

metal and engine hoods are sloped up to meet deep skuttle dashes which serve to house the gasoline tank. As heretofore the throttle is pedal operated, but a hand throttle has been added and this together with the spark advance lever are mounted on the inside face of the skuttle, or rather on the gasoline tank. The steering column, which is located at the right, also is braced to the skuttle. The control levers are placed in the center of the footboard. The wheelbase of the new model is 106 inches as against 86 for the older one, and tires are $32 \times 3\frac{1}{2}$, both front and rear. Five-passenger touring, roadster and inside

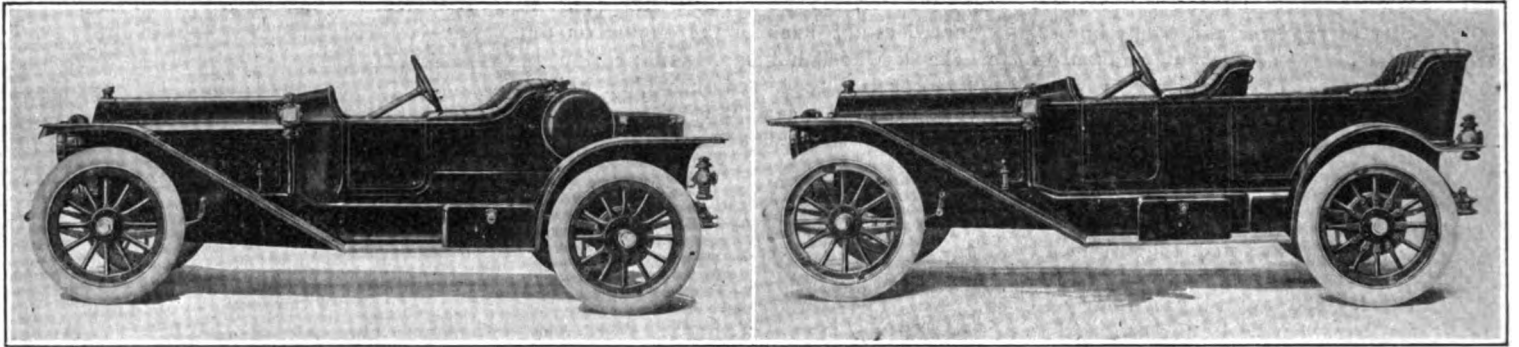
driven coupe bodies are the three styles that are regularly supplied.

De Tamble Cars—All of 36-Horsepower; Price Range, \$1,000—\$1,500.

Though De Tamble cars always have presented an appearance that suggests a considerably higher price being warranted, even greater value is apparent this year than heretofore. But a single chassis of 36-horsepower now is employed and on it there are mounted several different types of body ranging from roadster to five-passenger touring, though chief interest centers around a speedy-looking roadster of the torpedo type finished completely in white. It is a low-hung creation, completely equipped even to an engine-starter, and the doors are wide. The steering wheel is located on the right side, and conforming to the general tendency, the gear shift and emergency brake levers are placed in the center of the footboard. As regards the chassis, there are a number of alterations which are distinctly worthy of note as bearing directly on the increased value which the line as a whole presents. In the first place, though the same type of unit power plant supported at three points is retained, the dimensions of the motor have been increased from $4 \times 4\frac{1}{2}$ inches to $4\frac{1}{4} \times 5$ inches. As heretofore, three speeds, selectively obtained are provided in the change-gear mechanism and the clutch is of the multiple disk, cork-insert type. The semi-floating rear axle has been replaced by one of the full-floating type, however. Tire sizes have been increased to 34×4 instead of $34 \times 3\frac{1}{2}$, and the wheelbase has been lengthened out two inches to 117 inches. In line with the general revision, equipment has been made more complete and now includes engine-starter, electric lights, demountable rims with an extra rim, shoe, tube and cover, and a top, windshield and speedometer in addition to such other items as tools, Prest-O-Lite tank and the other accessories which usually go to make up a complete equipment.

Michigan Cars—Power Range, 30—40; Price Range, \$1,150—\$2,500.

A single Michigan car—a new model which has been developed since last the Michigan line was exhibited to the New York motoring public—is displayed at the stand of the Michigan Buggy Co. The new car, which is rated at 40-horsepower, and the older one which is styled the Michigan "33" are the only two chassis which are built, and on them are mounted several types of bodies from roadster to five-passenger touring. As becomes the products of an old-line carriage builder, the bodies are roomy and well-proportioned, and display careful thought and attention to small details. The older chassis is continued practically without change, and though the 40-horsepower model is a new creation it is substantially an enlargement of the "33" and in it are incorporated the principal



THE HAVERS "6-44" IN ROADSTER AND FOUR-PASSENGER TORPEDO FORMS

mechanical features which have proven of value in the smaller model. The motor has four cylinders cast in a single block and in common with so many other of the later products is of the long stroke type; the cylinders measure $4\frac{1}{4}$ inches bore and $5\frac{1}{4}$ inches stroke. The valves are exceptionally large, and all the moving parts are fully enclosed and protected. Other excellent features which are common to both chassis are a dry plate multiple disk clutch, three-speed selectively operated change gear mechanism and three-quarter floating rear axles.

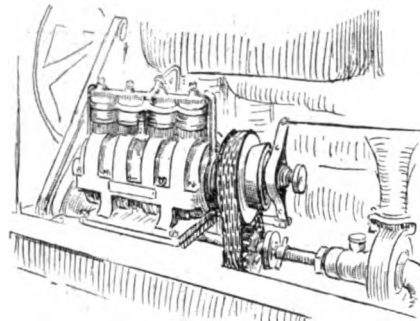
Krit Cars—All of 30 Horsepower; Price Range, \$750—\$900.

Not much room or reason was found for change in the Krit cars, and the few that were made are largely minor refinements. The wheelbase has been increased to 100 inches, and the gear-set has now three speeds forward. The frame has a double drop and is inswept forward to give a large angle of lock to the steering wheels. The wheel and tire sizes have been increased to $32 \times 3\frac{1}{2}$ inches. A new roadster model is fitted with side doors and has a large oval gasoline tank fitted immediately back of the seat, and a generous trunk on the tail, the skirts of the rear mudguards effectively protecting the latter from dirt, etc. Another body type is a five-passenger touring car with side doors and gasoline capacity greater than that of the 1911 models.

McFarlan Cars—Power Range, 40—60; Price Range, \$2,100—\$2,900.

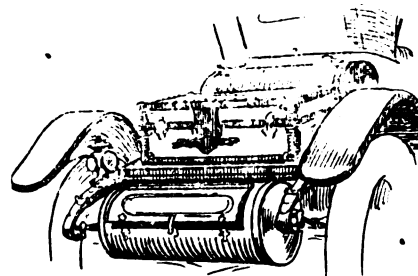
When the McFarlan "6-60" is referred to it implies more than it formerly implied, the

motor having been increased to $4\frac{1}{2} \times 5$ inches; center control also has been adopted. The equipment includes an en-



McFARLAN AIR PUMP DRIVE

gine starter of the compressed air type. It draws its air from a steel bottle which is filled to the required pressure by a small four-cylinder air pump driven by silent



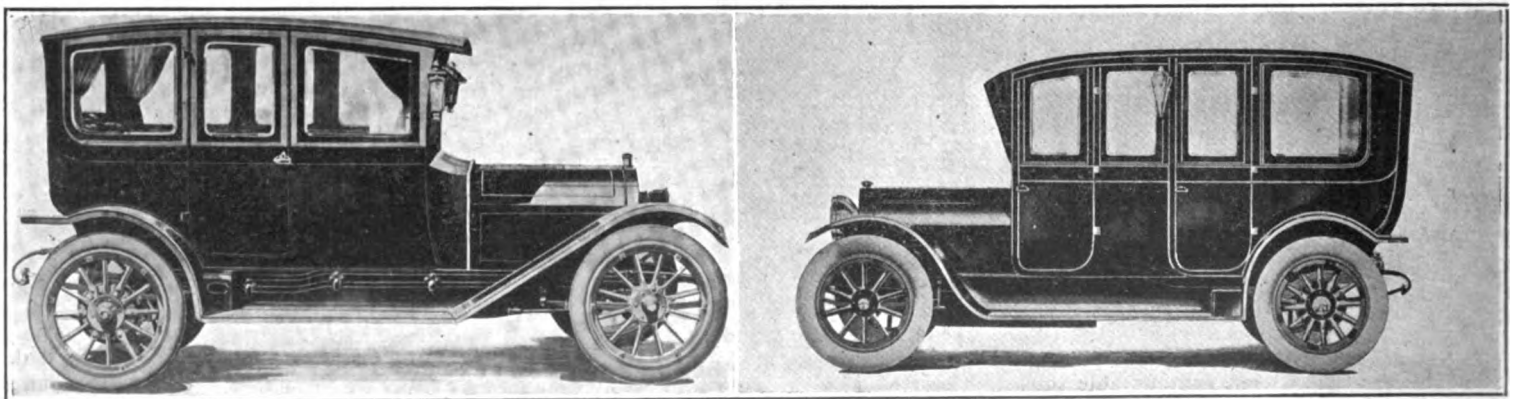
McFARLAN CURTAIN CUPBOARD

chain from the pump shaft of the motor. Provision is made for the pumping of tires by connection to the same pump. The

gasolene tank on this model is of generous size and parabolic in section, being mounted on the rear of the rear seat and enabling the feed to be by gravity no matter what the nature of the surfaces run over. It has a capacity of 17 gallons and a reserve of two and one-half gallons. A cylindrical box at the rear of the chassis serves for tool storage purposes, access being had by means of a large three-hinged door at the rear. On the smaller models, the wheelbase is now 124 inches, but the details are otherwise the same as heretofore.

Ottomobiles—Power Range, 35—40; Price Range, \$1,850—\$2,300.

The Otto car—it is now called "Ottomobile" by reason of the segregation of the automobile and gas engine departments of the Otto Gas Engine Works and the formation of a new company styled the Ottomobile Co., which will devote its entire attention to the production of Ottomobiles at a new plant in Mt. Holly, N. J., —is another brand which shows very little deviation from the construction which has proven successful in the past. The line has been increased in numbers, however, and instead of embracing a single chassis nominally rated at 30-35-horsepower, there now are two, the addition being a 40-horsepower model which is not unlike its older prototype, though it incorporates a number of features which are distinctly its own. Probably the most noteworthy of these, and one which is a radical departure from previous practice, is the placing of the steering wheel at the left side and the emer-



TWO NEW TYPES OF "BERLINE" LIMOUSINE—COLE "30" AND ABBOTT-DETROIT

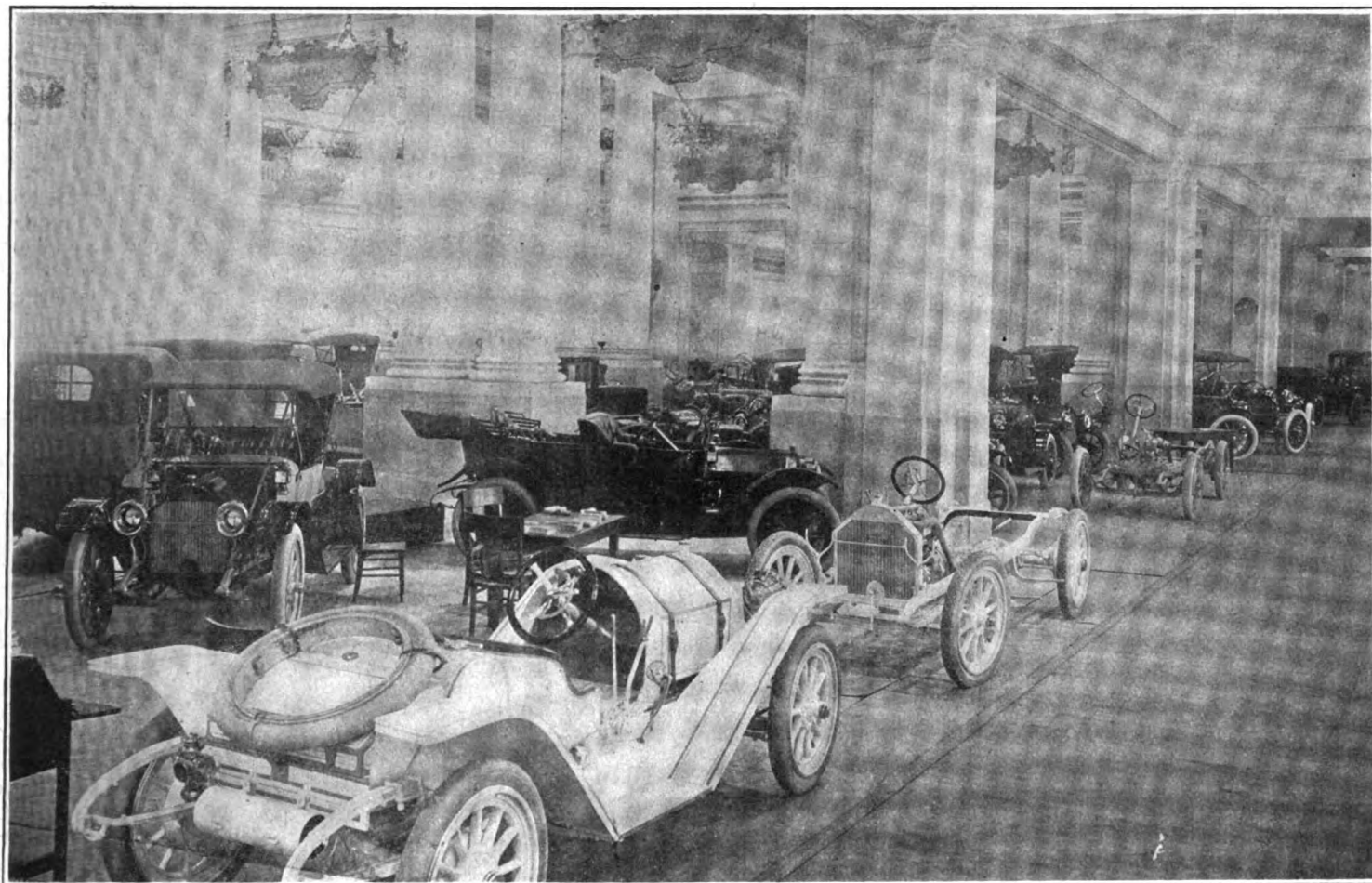
gency brake and control levers in the side. The motor employed is of the block type with cylinders which measure $4\frac{1}{2} \times 5$ inches bore and stroke, respectively. The motor which is used in the smaller car is the same as heretofore and has its cylinders cast in pairs. All the other details of the older car also are much the same, it having been found unnecessary to vary the construction. The new car has been styled the Otto "Parlor car," and its general aspect and the completeness of its equipment amply bear out the designation. The body

acetylene type and is common to both models.

Velie Cars—Power Range, 30–40; Price Range, \$1,350–\$2,750.

The Velie line which heretofore has been mounted on but one chassis rated at 40-horsepower has been increased by the addition of another which is rated at 30-horsepower. It is styled the "Velie Junior," and in structure is quite different from anything that has borne the Velie name-plate in the past. For instance, the motor is a block

wheelbase of the Velie "Junior" is 113 inches, and the tires are $36 \times 3\frac{1}{2}$ front and rear. In the evolution of the new car, however, the older model has not been overlooked and several changes of a minor nature have been made. Small as they are, however, they are in direct line with the policy of the manufacturers constantly to make better a car that always has been good. Thus, for instance, the magneto has been changed over to the left side of the engine to increase accessibility and an oil indicator has been added. The brake rods now



LOOKING DOWN ONE OF THE CENTRAL AISLES ON THE MAIN FLOOR—LION EXHIBIT IN THE FOREFRONT

presents the same low appearance for which Otto cars have become noted, and particular attention has been given the upholstery with a view to producing the greatest possible degree of comfort. The cushions are eight inches thick and are more than usually resilient. One of the clever features of the car lies in the use of glass "show cases," in which all the dash instruments are housed; these cupboards are fitted with locks to prevent undesirable attention at the hands of persons other than the owner. In the matter of equipment, the car really is unusual judged merely from its price, which includes a combination dynamo and magneto for electric lights and ignition, respectively, top, windshield, speedometer, demountable rims, and cocoa step mats, not to mention an engine-starter. The latter device is of the

casting and reflects the modern tendency toward long strokes, the cylinders measuring $3\frac{3}{4}$ inches bore and $5\frac{1}{2}$ inches stroke. By way of contrast it may be remarked that the older Velie motor measures $4\frac{1}{2} \times 5\frac{1}{4}$ inches. Similarly, instead of being mounted in the waist of the chassis as it is in the older models, the change gear mechanism in the new car is carried on the rear axle in a unit housing with the differential; three speeds forward and reverse are provided. The clutch also is different, and is of the leather-faced cone type and is distinctive in that it operates in an oil bath, the flywheel being enclosed in an extension of the crankcase. The three-plate clutch used in the older models has been improved so that adjustment is facilitated and the whole mechanism has been enclosed, making it dust and dirt proof. The

are placed inside the frame, where they are in a more protected position and the tubular torsion member has been replaced by one of pressed steel. Brake drums have been made larger, and all through the chassis there is apparent an attempt at greater simplicity and a general refinement of details. Bodies now are of aluminum, and several new styles have been added, prominent among which is a luxuriously appointed six-passenger touring car of the closed-front flush-sided variety. It is replete with the usual equipment for the comfort of passengers, and incorporates a complete electric lighting system in which the generating unit is a Vesta dynamo. The equipment of all the cars in the Velie line with a compressed air starter as at first announced has been discontinued and hereafter all will have Prest-O-Starters instead.

Warren Cars—Power Range, 30—40; Price Range, \$1,300—1,700.

The Warren line which heretofore employed but one general type of chassis, the designation of which—Warren "Thirty"—also served to state the power, has been increased by the addition of two new models which have been brought out in response to a demand from those who desired cars of higher power, but in which many of the sterling qualities which have marked the Warrens of other years past are incorporated. Similarly, the Warren "Thirty K" has been developed and is an amplified and generally refined edition of the former "Thirty." Though such well-tried features as the block motor, the large aluminum cone clutch and the three-speed gear set have been retained in it, as have a number of other Warren features, the chassis and the bodies have undergone a general refinement and present a handsomer and sturdier appearance than ever before. The equipment also has been increased and includes an engine-starter of the acetylene type, as well as the usual top, windshield and all the rest that go to make up standard equipment; demountable rims are included as a matter of course. Of the two larger models, the "Thirty-five," which, as its name suggests is equipped with a 35-horsepower motor, is supplied in three body styles in which the general lines are well-proportioned, and present a true straight-line effect. The three styles are a five-passenger touring car, a five-passenger torpedo and an enclosed body roadster; all of them are listed with complete equipment including engine starters. The "Forty" is made in but a single style—a five-passenger, closed-front touring car.

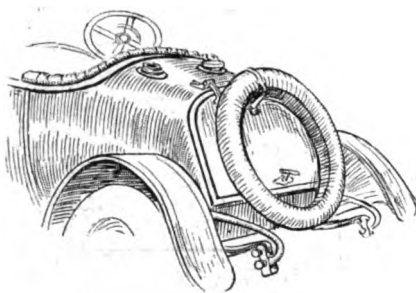
Bergdoll Cars—Power Range, 30—40; Price Range, \$1,500—\$3,000.

Except for the addition of a new model rated at 40-horsepower, the Bergdoll line has changed but slightly since last it was presented for public view. The 30-horsepower models which heretofore have been the only ones produced have undergone slight revision calculated to render their action more efficient, the principal changes being the adoption of a heavier type of rear construction in which a two-bearing pinion shaft in the differential is used, the relocation of the service brakes on the rear wheels instead of on the transmission, and the adoption of a new type of adjustable pedals. Body styles have been altered scarcely at all, though the equipment has been made more complete by the addition of a Prest-O-Starter. Though the 40-horsepower car is a new model it has been brought out to supply the demand for a car of greater power in which are incorporated the essential features of the smaller car, and to this end it remains substantially the same as its predecessor except that the motor is larger and measures 4 x 5 5-16 inches bore and stroke. The change-gear mechanism also is slightly different, and

provides four speeds ahead and one reverse, third speed being direct drive; the 30-horsepower model has a three-speed gear set and both are selectively operated. Other excellent features which are common to both chassis are the multiple disk clutch and full-floating rear axles.

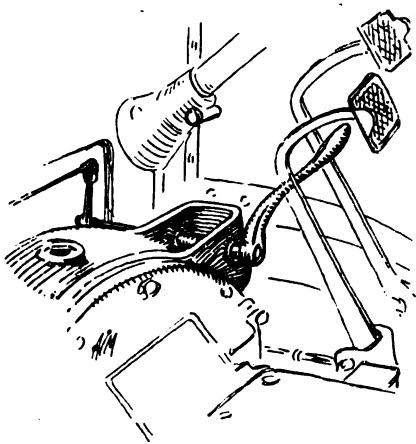
Pathfinder Cars—All of 40-Horsepower; Price Range, \$1,750—\$2,250.

In line with the ever-growing tendency to reduce friction to a minimum and provide



PATHFINDER REAR COMPARTMENT

for the taking up of wear, the manufacturers of the Pathfinder have made ample provision in the use of bronze bushings in the eyes of the dumb-irons, rear spring-shackle pin supports, change-gear tube apertures in the frame, and in fact, at all other points where bushings can possibly be placed. This attention to fitting is characteristic of the Pathfinder and also of that of its older



PATHFINDER SWINGING ACCELERATOR

sister car, the Parry, made by the same company. Of the four luxurious types of body regularly fitted to the single Pathfinder chassis, the "Armored Roadster" is most notable. The rear portion of this body is formed into a 25 gallon gasoline tank aft of the seat, and the remainder is given over to a storage compartment. A swinging type of accelerator pedal interlocking with the throttle linkage at the foot of the steering column is employed. The rear axle is of the full floating type, and has the torque tube attached to the canter cross-member of the car frame by a yoke; this construction takes care of torque and tractive efforts, and does away with radius and other members. The housing of the axle is of pressed steel of exceptional

strength, and inspection is afforded by means of a large plate at the rear of the differential portion. Adjustment of the bevel pinion is made from the outside. Another new body style is that of the "Martha Washington" coach, fitted in Colonial style.

Westcott Cars — Power Range, 40—45; Price Range, \$1,800—\$2,250.

Where more than three points of suspension are employed on the motor and gear set, the sub-frame mounting probably is the most satisfactory solution of the problem of how best to prevent any weaving of the frame. Long experience in America and Europe has shown the reliability of this method of mounting and in the Westcott cars examples of the best practice in this direction can be seen. Not that the adoption is new, for the earlier Westcott models employed it, and like the use of roller bearings on the front and rear axles and wherever else possible, the interlock between brake lever and clutch, and dual ignition with provision for a separate timing device, on the motor is a continuation without any change whatsoever. The steering gear is unique in being of the screw and wedge type with final operation of the lever by wedges acting on a rocker after the Malicet et Blin type. The actuation of the wedges is by threads cut on their interiors and these threads mesh with those of the screw. Another fitting by which the Westcott may be recognized is a circular section quadrant on the steering wheel, left smooth, with the throttle and spark levers provided with curved sliders fitting over the quadrant. The accelerator is of the swinging type, projecting vertically through a slot in the footboards and the cone clutch is fitted with take-up springs to facilitate easy engagement. There is a spring fitted to the change gear lever tube to ordinarily keep it in the slot for intermediate and high speeds, and thus prevent accidental engagement of the reverse or low speed on a hasty change or at night. The rear springs have been increased to 56 inches span. The larger motor is on the same lines as the 40-horsepower model, but with a bore and stroke of 4 3/4 and 5 inches respectively, and fitted only to the model R, a seven-passenger car with side doors and inside control.

Great Western Cars—All of 40-Horsepower; Price Range, \$1,600—1,750.

Concentrating its efforts on the production of a single chassis of 40-horsepower, which almost literally has been gone over with a fine-toothed comb to bring to light such features as in the eyes of the designers were susceptible of even slight improvement, the Great Western Automobile Co. has materially enhanced the value of its line. Nothing of a radical nature has been attempted, however, the improvements being principally a general smoothing down in which both chassis and bodies have taken on an added touch of beauty and refinement. Mechanically, the chassis is almost

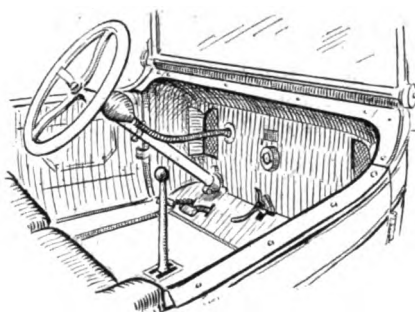
identical with the previous model, the only change worthy of mention being the enlargement of the camshaft bearings. Otherwise the motor is unaltered and features the same efficient combination of overhead exhaust valves and side intake valves. The other essential features of the chassis which remain unchanged embrace a large Raybestos-faced cone clutch, three-speed selective change gear mechanism and semi-floating rear axles. Bodies have been changed materially; in fact, the body range is new throughout and leaves little to be desired from the point of variety and comfort. There is more room in all of them, cushions have been made more luxurious and there is a general tendency apparent to subdue sharp angles and unpleasing protuberances. On the touring and roadster bodies, the doors are really detachable and the phrase means all that it is intended to convey. Which is to say that jambs and all come away when the doors are removed, leaving a perfectly finished open car. Equipment, too, has been thoroughly revised and includes a Prest-O-Starter; on the \$1,750 cars, the old bulb horn has been replaced by a Typhoon electric signal; the gasoline tank is provided with a gauge; the tool boxes have been increased in size, and now are large enough to accommodate the tire pump and the numerous other tools without crowding; demountable rims now are standard equipment and a last touch of exclusiveness is added in the black and nickel finish of the Solar lamps. The head lights are electric, operated from a large storage battery, but the side and tail lamps are of the oil variety to provide for possible contingencies requiring the removal of a lamp for inspection purposes.

R. C. H. Cars—All of 25-Horsepower; Price Range, \$700—\$1,150.

When the R. C. H. car first was placed on the market it is safe to say that by reason of the incorporation of many of the best features that heretofore have been found only in cars of considerably higher price, it created something akin to a genuine sensation. There now has been added to the line what is styled the "SS" series and it bids fair to rival in popularity its popular brother for the simple reason that there is even more real value sticking out all over it, if that is possible, than there is in the older series. Strictly speaking, the car is new to the show-going public, but though it never has been exhibited before it has been on the market several months and since its formal announcement it has gained a reputation for itself.

R. C. H., it may be said in passing, are the initials of R. C. Hupp, who, as everybody knows, has been intimately connected with the automobile industry for years, and who has had a hand in bringing out several other moderate-priced and moderate-powered cars that have made names for themselves. The R. C. H. he regards as his best achievement, however, and on it he

has lavished his designing experience so that it fairly bristles with unusual and distinctive features. For instance, left-hand drive has been adopted and this together with center control and a motor that belongs rightfully and properly in the long-stroke class are features that give distinction alone; the motor has four cylinders cast in a single block, the bore and stroke being $3\frac{1}{4}$ and 5 inches respectively. The clutch is of the leather-faced cone type, and the change gear mechanism, which provides three speeds and reverse, selectively obtained, is mounted in a unit with the differential and rear axle. The operation of the car has been simplified by the elimination of the usual emergency brake lever, its place being taken by a pedal with a ratchet stop; the service brake is intercon-



R. C. H. DASH AND CONTROLS

nected with the clutch pedal. Externally, the car, or rather the cars, for all of them have practically the same lines, present a decidedly British appearance, obtained by the use of a high, flat engine bonnet and exceptionally high-sided bodies which are finished in a pleasing combination of red and black. The new, or "SS" series, differs from the other only in the matter of equipment which includes a self-starter of the acetylene type, a Prest-O-Lite tank, dual ignition, demountable-detachable rims, top, side curtains, windshield, lamps, horn and tools. The standard models include as equipment all these items except the engine starter, the gas tank, and demountable rims, and both models are supplied as either roadster, four-passenger touring car or Colonial coupe.

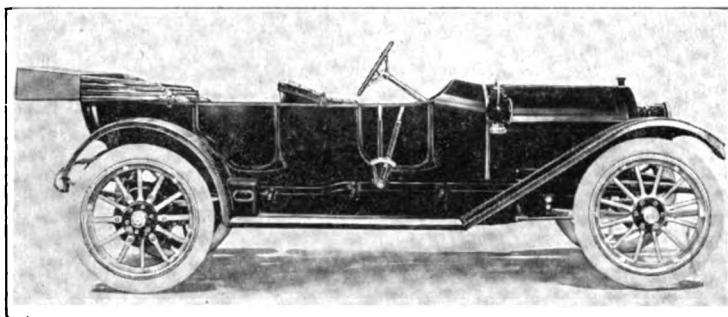
Kline Cars—Power Range 30—60; Price Range, \$1,750—\$3,500.

Though the Kline line of cars has been somewhat depleted by the discontinuance of one model, the "four-thirty," it still allows considerable latitude for choice, inasmuch as there remain no less than four other distinct models ranging in power from 30 to 60. Two of them, rated at 30 and 40-horsepower, respectively, are of the four-cylinder variety and the other two rated at 40 and 60-horsepower are equipped with six-cylinder motors. All of them belong in the class of more impressively constructed cars in which the individuality of the manufacturers is apparent in every detail, and they present an appearance that scarcely might be expected from an inspection of

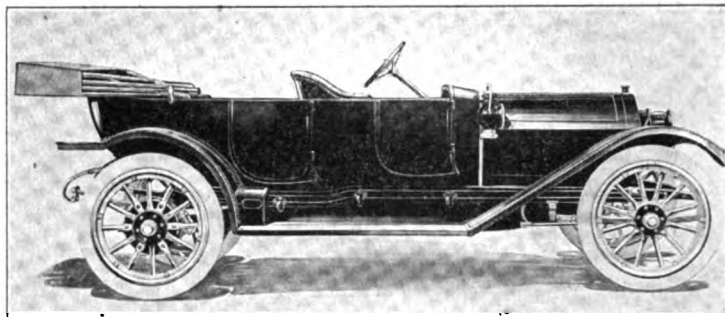
their price tags alone. As is the case with so many other makes of car, very little cause for variation from previous practice has been found, the manufacturers concentrating their attention rather on making their complete equipment even more complete. In reality there are but three changes, which are of such character as to be distinctly worthy of note and these are embraced in the adoption of a slightly different style of rear axle construction whereby greater accessibility is gained, the adoption of a new type of universal joint between the clutch and the gear set, and the substitution of a four-speed change gear mechanism for the three-speed mechanism that was used last year. Other improvements which have been made include the adoption of slightly larger tires, two systems of ignition, one of which is by high tension magneto, the other by coil and battery; a siphon feed oil indicator on the dash and a new type of annular combination radial and thrust bearings for the front wheels. Equipment has been made more complete by the addition of engine starters, demountable rims, detachable front doors, tops with side curtains, windshields and a new type of tire irons bolted directly to the chassis frame.

Schacht Cars—Power Range, 24—45; Price Range, \$730—\$2,500.

Though innovations in seating arrangements are scarce, a decidedly novel method of disposing of eight passengers is incorporated in the new Schacht model PP. Facing the rear, and built close up to the partition separating the tonneau from the driver's quarters, is a seat built to accommodate two persons. Aside from the fact that the arrangement is radical, it has much to commend it, a considerable gain in "navigable" space without the necessity of folding up seats, being the result of its adoption. Between the driver's compartment and the tonneau, and so arranged that it can be instantly slid into a recessed pocket, is a second or supplementary windshield. The forward compartment is ventilated by means of a long opening in what may be termed the "super dash," that is, a filler between the dash proper and the lower support of the wind shield. A shutter is provided to regulate the draft of air. The body is mounted on a chassis equipped with a 4-cylinder, block motor of 45-50-horsepower. The bore and stroke are $4\frac{1}{2}$ inches and 5 inches, respectively. The motor is rendered nearly noiseless, and the mechanism protected from grit by a plate which encloses the valves. Included in the regular equipment are top, speedometer, windshield, and Prest-O-Starter, which equipment is now standard on all four-cylinder Schacht cars. The other Schacht four-cylinder models all are built on the same chassis, but are equipped with 40-horsepower block motors in which the bore and stroke are 4 5-16 inches and 5 inches respectively. The line includes two road-



COLE 30-40 SMALL TONNEAU MODEL



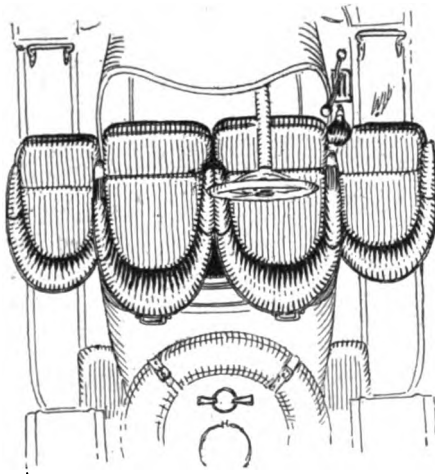
COLE CLOSED-FRONT TOURING CAR

sters, and an open and a closed-front touring car, the later being arranged for left-hand drive; in the other the position of the control elements is optional. The line also includes five body styles designed to be used on the two-cylinder, 24-horsepower chassis.

Cole Cars—Power Range, 30—40; Price Range, \$1,885—\$3,250.

The Cole line is another which up to quite recently has been built upon a single chassis. The addition of a new model with a long stroke motor, however, has considerably broadened this well-known line which now presents greater latitude for choice. The smaller and older chassis remains substantially unchanged and mounts the same efficient type of "square" motor in which the cylinders have the same bore and stroke, namely $4\frac{1}{2}$ inches. Hereafter, however, there will be but a single body mounted on this chassis,—one of the popular racy type which employs modified bucket seats and large tanks. It is distinguished as being one of the first "speed cars" to be equipped with an engine starter and also a complete electric lighting system. As a matter of fact the same Ward-Leonard electric lighting system now is common to all the cars in the Cole line. Similarly all of them are equipped with engine-starters of the acetylene type. In the new Cole models, which are designated merely as "series seven," the cylinders of the motor are cast in pairs, the bore and stroke being $4\frac{1}{2}$ inches and $5\frac{1}{4}$ inches respectively. In other respects it is much the same as the smaller motor except that the oiling system has been changed to pressure feed through a hollow crank shaft.

The motor, change gear and clutch form a rigid unit which is supported at three points. Three speeds and a reverse are provided in the gear set and the clutch is of the leather-faced cone type similar to that used in the smaller chassis. The body exhibit, of course, is comprehensive and includes roadster, touring car and coupe models and a new roadster model mounted on the smaller chassis which is unique in that it provides accommodation for four persons abreast. Another type of com-



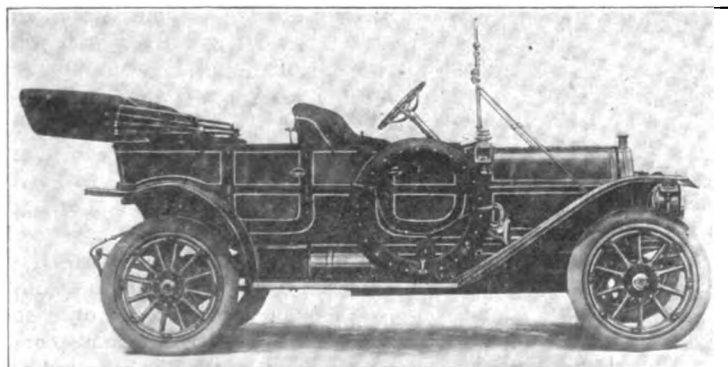
UNIQUE COLE FOUR-SEATER

partment roadster which is displayed also draws attention, both by reason of its prepossessing appearance and the decorative scheme which has been adopted to attract the gaze of show-goers. It is finished in chaste white and perched on the lamps and the radiator there are white doves which support streamers of red satin ribbon attached at the back of the car. A luxurious

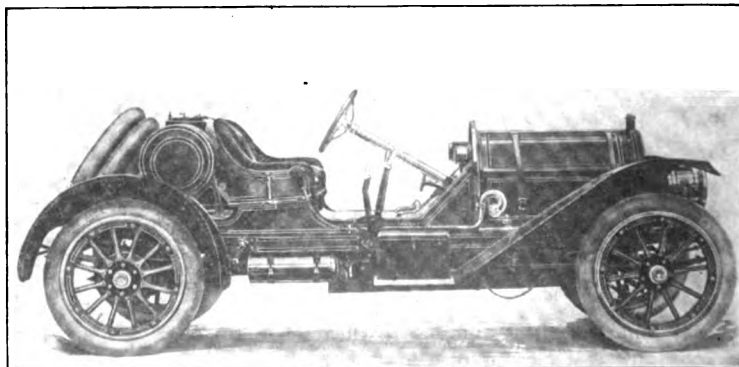
double limousine of the Berline type rounds out and adds to the distinction of the line.

Metz Cars—All of 22 Horsepower; Price, \$495.

If not for the reason that the Metz cars are the only pleasure vehicles in the Palace which exploit friction drive, then for the reason that they embody a number of other features equally as radical and equally as exclusive, this particular brand is worthy of more than passing interest. Barring one change in construction, which is a big one inasmuch as it lies in the adoption of a four-cylinder motor in place of the two-cylinder motor that previously was employed, the line is substantially without change. The new motor is rated at 22 horsepower, and is unusual in that it is of block construction with removable cylinder heads; the bore and stroke are $3\frac{3}{4}$ inches and four inches respectively. The transmission elements remain unchanged and are distinguished for their simplicity and their novel arrangement. Two simple disks, one driven by the engine and the other mounted at right angles to it on a transverse shaft constitute the mechanism by means of which the various speed changes are obtained, a pedal serving to bring the two disks together and a lever to vary the position of the driven disk with relation to the center of the driving member. Final drive is by means of side chains to the rear wheels. Another of the distinctive and exclusive features of this interesting little vehicle lies in the use of multiple disk brakes mounted in the rear wheel hubs. A single type of roadster body is supplied on the chassis and the price of the car includes complete equipment, even to a top with



VELIE FIVE-PASSENGER TOURING CAR



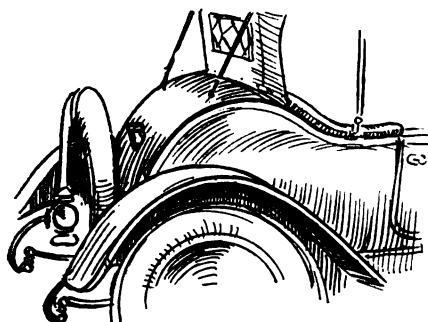
VELIE RACYTYPE ROADSTER

slip cover, gas headlights and generator, high tension magneto and a full complement of tools.

Firestone-Columbus Cars—Power Range, 30—45; Price Range, \$1,700—\$3,000.

Left-hand steering, center control and unit power plants are characteristics of all the five models built by the Columbus Buggy Co.—seven-passenger touring car, five-passenger touring car, limousine, roadster and runabout—and all except the little runabout, which has a four-cylinder motor of four inches bore and stroke, are equipped with engine-starters as part of their standard outfit. Three-speed selective gears, cone clutches and shaft drive are common to all models, and throughout the line polished brass has been discarded and its place taken by black enamel and nickel, making a finish that is attractive and at the same time easily kept clean.

An interesting little car is the runabout, which is of the popular closed-front type with a large cylindrical gasolene tank in



FIRESTONE TANK LOCATION

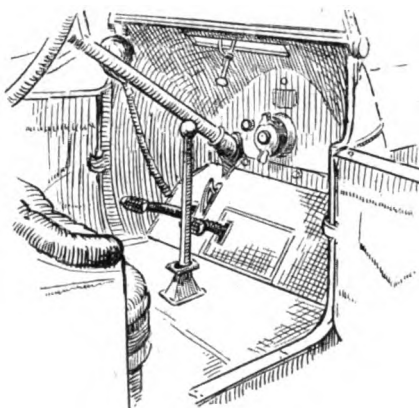
the rear of the seat. There is an unusual amount of room in the car between the seat and the dash, and advantage is taken of it to install a folding seat on the right-hand side so that a third passenger can be accommodated, facing toward the rear. The top is worked out in an ingenious way. When it is raised, the side curtains directly over the doors of the car are fastened to the top of the door and not to the top or to the front or rear sections of the curtains, and are supported on light rods. When the door is opened part of the curtain opens with it, making the little machine practically a coupe. Large celluloid windows render possible an unobstructed view in all directions.

All these cars are fitted with tops, wind shields, speedometers, gas lamps, and the usual tools and accessories. The larger cars—in fact, all except the runabout—have, in addition, electric side and tail lamps with storage battery, demountable rims, an extra demountable rim, robe rails, floor matting for the tonneau and Prest-O-Lite tank casing.

King Cars—All of 36-Horsepower; Price Range, \$1,565—\$2,165.

Not all manufacturers incline to the conventional in design, and of those who do not, the King Motor Car Co., of Detroit,

Mich., has the distinction of having produced a car which probably embodies a greater number of radically different and exclusive features than are to be found in any other car within easy reach. Strictly speaking the car is new—at least it is new to the show-going public for this was its first appearance at any show—though it has been on the market for nearly a year—long enough to demonstrate the worth of its distinctive construction. A single chassis rated at 36-horsepower is produced and the motor, clutch and gear set are combined



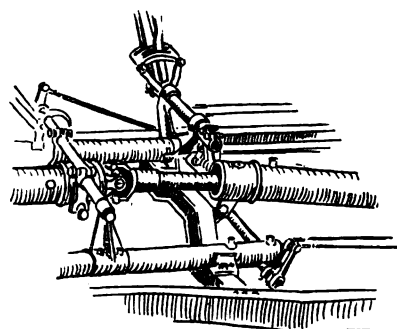
KING CONTROL ELEMENTS

to form a rigid unit. Cylinders are cast in a block and measure 3 13-16 inches bore and 5 1/8 inches stroke. One of the first of the distinctive features which is revealed lies in the use of valves which are inclined seven degrees out of the perpendicular, which construction, it is explained, permits quieter valve operation, and at the same time makes for greater efficiency inasmuch as the gases are afforded a straighter passage; the valve stems and springs are enclosed by means of removable cover plates. Left-hand steer with center control is another of the excellent features of the car. The emergency brake lever has been eliminated, its place being taken by a pedal with a ratchet stop, and the gear shift lever is a perfectly straight, plain rod, which rises from a neat housing in the center of the footboard, and terminates in a knob. A three-speed selective gear set is used and power is transmitted to full-floating rear axles through the intermediary of a multiple disk clutch, which is enclosed in the flywheel and operates in an oil bath. Another of the exclusive features with which the car fairly bristles embraces the use of a two-bladed "aeroplane" type of cooling fan. Externally, the cars also are unusual, probably the most notable feature being the rear spring suspension, which is patented and of course is exclusive. The springs are long, flat leaf members pivotally mounted on the chassis frame near their centers and rigidly attached at the front ends. The rear ends are attached directly to the axle by means of shackles. This peculiar type of spring suspension, it is claimed, eliminates a great amount of road shock and sidesway, and at the same time obviates the necessity

for auxiliary shock absorbing devices. The front of the cars also is distinctive by reason of the incorporation of a patent "fender unit." This unit embraces a steel tube, which serves as a gas conveyor for the lamps which are mounted on it, and also as a means of fastening the mudguards. Several styles of body are exhibited, including roadster and touring car models, and one of them in particular—an inside driven coupe—presents an unusually attractive appearance.

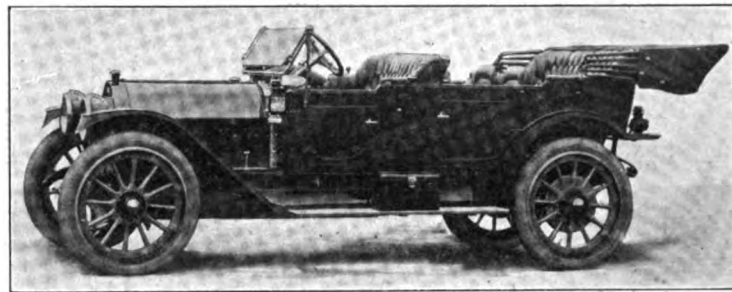
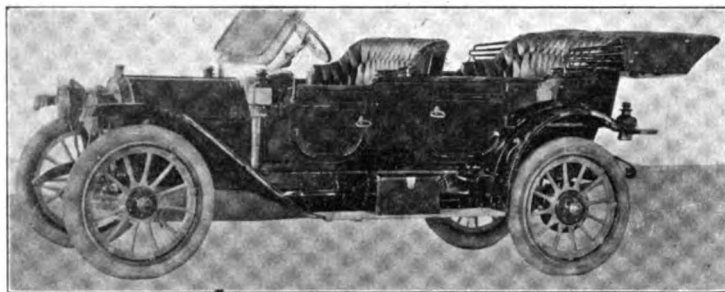
Regal Cars—Power Range, 25—35; Price Range, \$900—\$1,400.

There are but two exponents of the underslung principle of construction at the show and one of them is the Regal. It is not strange, therefore, that the exhibit should be of unusual interest, both for this reason and also because Regals are the first of the type to be offered for less than \$1,000. Underslung construction, it may be added, embraces the positioning of the chassis frame under the axles instead of



REGAL TORQUE TUBE SUPPORT

over them, as is the usual custom. Its advantages are manifold, though the one that is paramount is that it permits a considerably lower center of gravity of the car and therefore reduced the tendency to "turn turtle" when abrupt corners are attempted at speed. To assist those who are not of a mechanical turn of mind to grasp the significance of the construction, a stripped chassis is exhibited and those who are patient enough to await their turn and examine it, carry away an impression of strength and solidity coupled with a degree of simplicity that is exceptional. The method of absorbing torsional strains is particularly worthy of note and embraces a torsion tube open at the front end and mounted on a bearing on one of the cross frame members. The drive shaft is enclosed in the tube. Two sizes of chassis are made in the underslung style, a 25-horsepower model and a 35-horsepower model. The former mounts a block motor with cylinders measuring 3 3/4 x 4 1/2 inches and in the latter the cylinders are cast in pairs and measure 4 1/4 x 4 1/2 inches. Either chassis is regularly equipped as a roadster, or as a four-passenger touring car, and in both forms presents that low-hung racy appearance so much in vogue. The older and more conventional overhung model which is rated at 30-horsepower and which has made a



THE "4-40" KLINE FIVE-PASSENGER TOURING CAR AT \$2,250 AND THE "6-60" AT \$3,500

record for itself for dependability is continued practically without change.

Imperial Cars — Power Range, 32—44; Price Range, \$1,250—\$1,750.

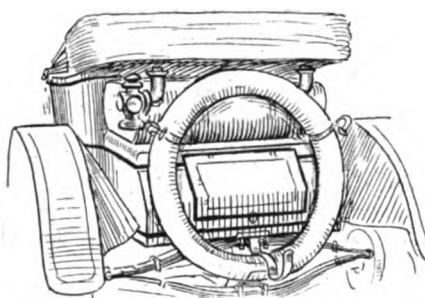
Perhaps the most interesting feature of the Imperial car is its motor clutch and change-speed gear system, all of which are mounted so as to form a unit which is suspended at three points—an arrangement that seems to be gaining in favor each year. Cylinders are all cast in pairs and are of the L-head type; the valves are all enclosed, the covers being easily removable. The oiling system for the engine is so arranged that the oil flows into a well at the bottom of the casing surrounding the flywheel; the flywheel picks it up and throws it into a reservoir at the top of the casing, whence it is distributed by means of oil grooves. The pistons and connecting rod big ends are lubricated by splash, the oil under the rods being maintained at a constant level.

Of the four models bearing the Imperial name-plate one is a two-passenger roadster and three are touring cars, seating five passengers, and all, including the roadster, are of the closed-front type. They are clean lined, well made and of attractive appearance. All are shaft driven and have full floating rear axles.

Paige-Detroit Cars—All of 25-Horsepower; Price Range, \$975—\$1,600.

While the Paige-Detroit car retains its former general constructional features and is unaltered in design, a few changes have been incorporated in the current models that tend to bring the car up to date and to provide the features that are now considered necessary in a pleasure car. Paige-

Detroit cars always have been equipped with multiple disk clutches, but in the new models the clutches have been improved by the addition of cork inserts, 36 corks being inserted in each of the five driving disks. The ten plates forming the clutch run in oil and in a tight casing. Another improvement consists in the enclosing of the valve operating mechanism, this being in line with the modern tendency towards silent running and the exclusion of dust from the working parts. Last, but not least, a Disco motor starter is used in connection



PAIGE REAR COMPARTMENT

with the standard Delco ignition system.

All the Paige-Detroit models are mounted on the same chassis, which embodies a unit power plant of 25-horsepower with all four cylinders cast in a single block; the crank shaft is of the two-bearing type. Simplicity in the construction and operation of the car is furthered by the use of a thermo-syphon cooling system, with belt-driven fan and cellular radiator. A selectively operated gearset gives three forward speeds and a reverse, and final drive is by shaft and bevel gears.

New body types include the Brunswick, a five-passenger closed-front touring car, and

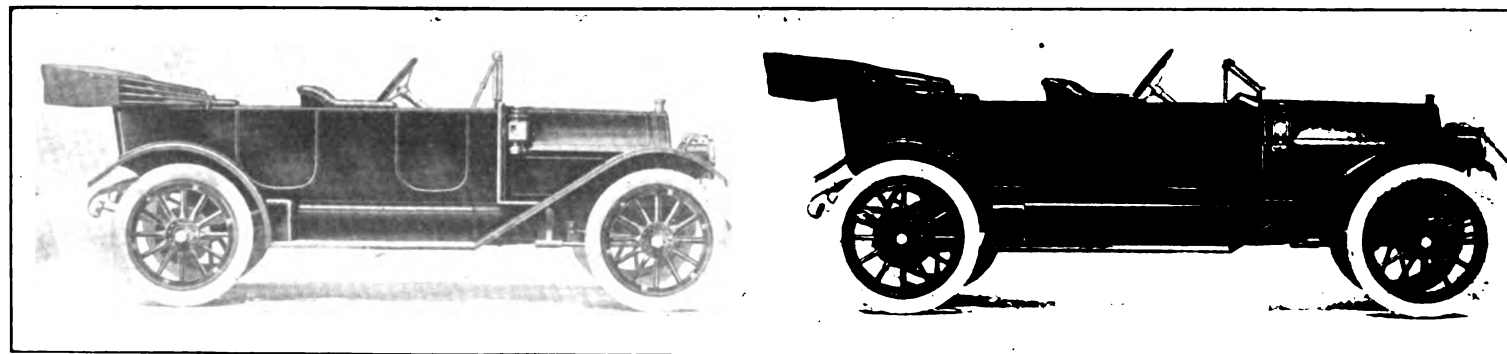
a high-speed runabout, called the "Brooklands" model. This is a racy-looking, low hung two-passenger machine with a big oval gasoline tank behind the seat, low seats and sharply raked steering wheel.

Reading 40 Cars—All of 40-Horsepower; Price Range, \$1,650—\$1,750.

In the category of moderate priced cars of medium power and those employing but one chassis for the various types of carriage work is the Reading 40, the successor to the Middleby of two years ago. The point of construction which attracts attention is the frame with a 6½-inch drop between the axles, resulting in a low body position without decrease of clearance. The motor is another notable feature, being of the "T" head type, but with all four cylinders in a single block casting. The oil sump in the crankcase is fitted with two cocks at different heights to determine whether the oil level is too high or too low; a Flechter carburetter has been adopted to "masticate" the fuel. The clutch cone has been increased to 16 5/8 inches diameter, and the flywheel to 19 pounds, contributing to steadier running at low speeds. The two sets of brakes are equalized by balancers and 36 x 4½-inch tires are being supplied.

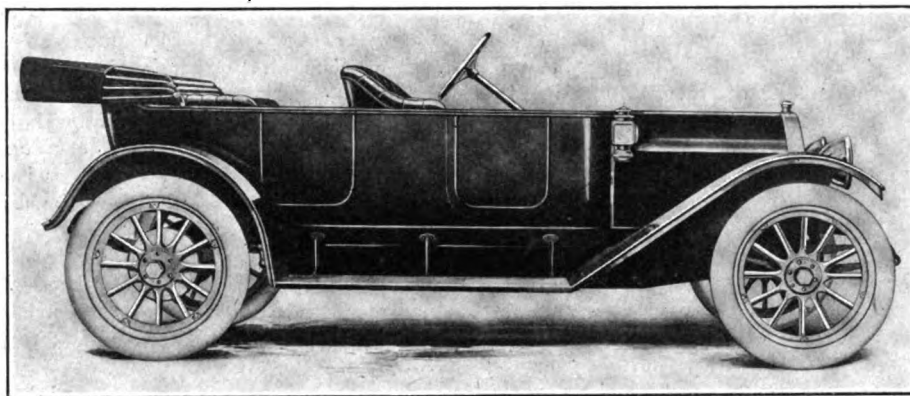
Cutting Cars—Power Range, 30—50; Price Range, \$1,200—\$2,250.

Except for a few refinements, justified by past experience, Cutting cars differ little from those that immediately preceded them. There is one noteworthy divergence from previous practice, however, embraced in a general enlargement of motors whereby an even greater surplus of power is obtainable. The 50-horsepower motor is the only one that has not been increased in bore



THE 40-HORSEPOWER \$1,750 IMPERIAL AND THE TORPEDO MODEL LISTING AT \$1,250

and stroke, but even this one has had its listed rating lowered by 10 horsepower, which amounts to the same thing. Of the others, the cylinders of the 30-horsepower motor have been increased in size from $3\frac{3}{8} \times 5$ inches to 4×5 inches, and those in the 35-horsepower motor now are $4\frac{1}{2} \times 5$ inches, instead of $4\frac{3}{8} \times 4\frac{1}{2}$ inches. As heretofore, the line includes four chassis, though but three motors are used; in their essential features, the four chassis are practically the same barring a difference in wheelbase, and the size of component parts to conform to the different size motors with which they are equipped. All of them feature cone clutches, and all except the largest, styled model 60, are equipped with three-speed selectively operated change gear mechanisms; in model F60 is retained the same four-speed change gear which has proven satisfactory in the past. All the bodies are of the closed-front, flush-sided type and present a unusually pleasing appearance that is enhanced by nickel-plated trimmings and careful attention to the elim-



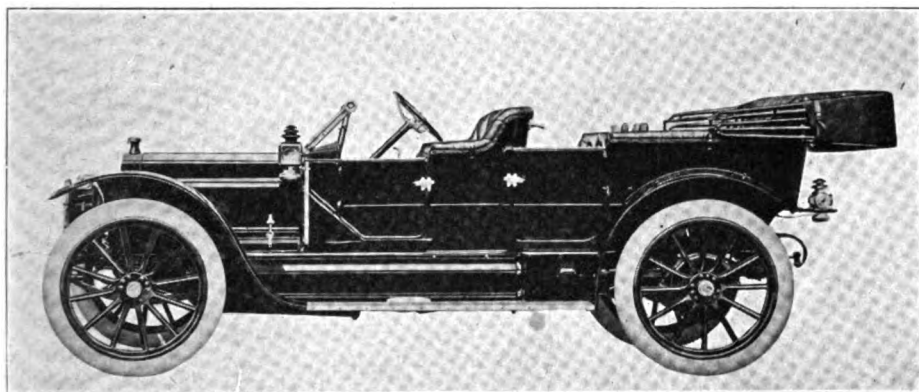
GREAT WESTERN CLOSED-FRONT "FOUR-FORTY"

the side location of the inlet valve chambers. This causes rapid and satisfactory expulsion of the burned charges and makes for a small combustion space with only the added area of the inlet valve chamber, instead of that of two chambers as in other types. The unit power plant, suspended at one side and fore and aft in the previous

of the clutch when withdrawn by the pedal. The frame has been slightly strengthened, particularly at the cross-members and the wheelbase is 116 inches, an increase of four inches over the models of 1911. The rear axle is of the full floating type with two torque tube construction spring mounted in front on the third cross-member, while the rear springs are 50 inches in length. The closed-front metal bodies which have been standard on the Lion since its inception and the flanged and skirted mudguards front and rear remain unchanged, as well as the inverted cone clutch, water-jacketed Stromberg carburetter and system of pump lubrication. An engine-starter of the acetylene type has been added to the equipment.

Penn Cars—Power Range, 30—45; Price Range, \$1,000—1,400.

By the addition of a four-cylinder, 45-horsepower model in "Pirate" sidedoor roadster model and torpedo five-passenger model, the Penn line has been increased to four models with two chassis of 30 and 45-horsepower, respectively. The smaller powered models, by which the cars of this make probably were best known, remain unchanged as to the power plant, running gear and other essentials, but the body on the roadster is now of the torpedo type with skuttle dash and side doors or without them as desired. The 45-horsepower model is in many respects an enlarged edition of the 30, but with the exception of the motor is



THE RAMBLER "MORAINE"—A 50-HORSEPOWER MODEL

ination of unsightly angles and such protruberances as door latches and hinges.

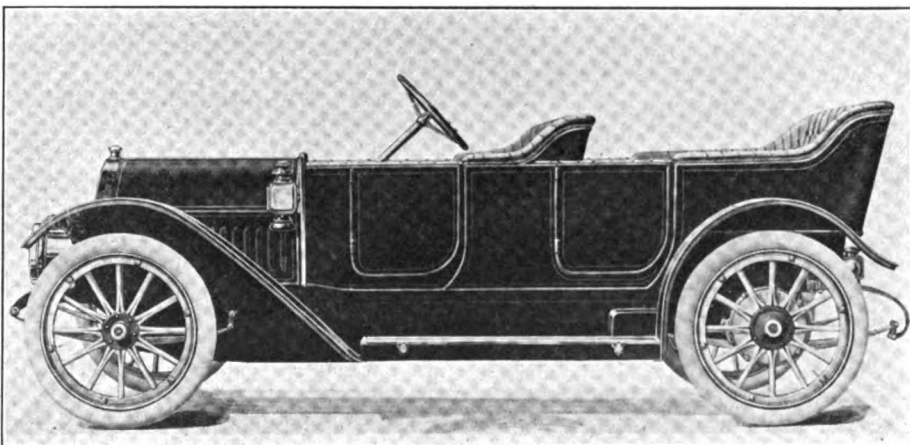
Paterson Cars—Power Range, 30—45; Price Range, \$1,250—\$1,850.

The addition of a seven-passenger 45-horsepower model constitutes the chief feature of the Paterson line, the new "45" chassis being substantially a larger edition of the smaller car. A multiple disk clutch however, is used in place of the cone employed on the other models; the wheel is 120 inches, and the rear axle is of the full-floating type. Rear springs of all models are of the full elliptical pattern. On the model 35, the wheelbase is now 108 inches and its body like the body on model 36, has been made more comfortable by keeping the bodies within the wheelbase. The 45 model succeeds the model 40 of last year.

Lion Cars—All 40-Horsepower; Price Range, \$1,550—\$1,600.

Discussion of exhaust valve positioning has not swerved the manufacturers of the Lion "40" from their stand. They are continuing the characteristic extension exhaust chamber above the cylinder casting, and

models, is now supported at two points only; in large trunnion bearings to the forward and center cross-members respectively. The clutch assembly inspection plate in the upper part of the clutch housing is fitted with a clutch stop whose position in a longitudinal direction is regulatable by slacking two nuts, so that the driver can "brake" at any desired position



WARREN CLOSED-FRONT "FOUR-FORTY"

fitted throughout with F. & S. ball bearings even to the circulating fan. The timing gears are lubricated by oil taken from the crankcase instead of by filling by hand as in the 1911 models. Accessibility is a feature of the motor, any connecting-rod, etc., being capable of removal without disturbing other parts of the motor after the lower half of the crankcase has been removed. The carburetter is a model L Schebler on all cars, superseding the D model on the 30. The cooling is by pump circulation and a worm and split nut steering gear is fitted. The rear axle is of the full floating type on this chassis, but is continued as a semi-floating type on the smaller chassis.

Electric Pleasure Cars.

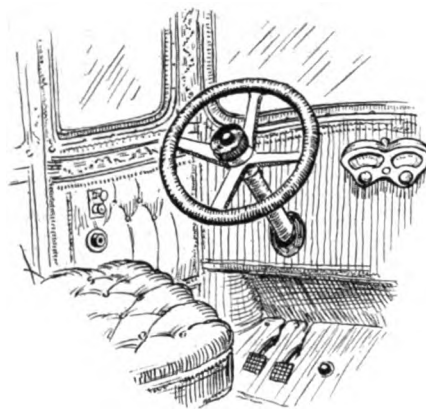
Argo Electrics — Price Range, \$2,800—\$3,000.

Though Argo electric pleasure and commercial cars made their first appearance at any show, they have been on the market for months and are in no sense an experiment, as they represent more than two years' constant effort to bring them to their present state of perfection. As a matter of fact, their outward appearance suggests the latest engineering practice coupled with an ingenuity of design that leaves little to be desired from either a mechanical or an esthetic point of view. Incidentally, they embody a number of features that are at once distinctive and exclusive. In the first place, the rear axle construction and motor suspension is unusual, inasmuch as axle and motor are combined to form a rigid unit of wonderful simplicity and compactness. The drive itself also is unusual, and exclusive, and is through herringbone gears without universal joints, chains or shafts. Another of the exclusive features which are embodied in the car lies in the use of a foot-operated controller which is interconnected with the service brakes. Normally the pedal is in neutral position in the center of an elongated slot where it is held by means of a ratchet stop. Downward pressure on the pedal applies the brakes, and when the pedal is allowed to rise under the action of a spring, the current is turned on in varying degrees of strength corresponding to the six speeds which are obtainable. Thus it is impossible to apply the brakes when the current is turned on or to turn on the current when the brakes are applied. The standard battery equipment comprises 30 cells of 15 plate Exide. Iron Clad exide batteries will be supplied at the option of the purchaser, though a slight additional amount is charged for them. The wheelbase of the pleasure cars is exceptionally long—110 inches—and two body styles are regularly supplied on it. They are a brougham, which has seats for four passengers, two facing forward and two facing the driver, and a new town car, also of four-passenger capacity, but in which the driver's seat is in front of the wide rear seat; the fourth passenger is carried on a comfortable seat

across the front corner diagonally opposite the driver. Two types of commercial vehicles, rated at 1,000 pounds and 2,000 pounds capacity, respectively, also are manufactured. Naturally their construction is quite similar to that of the pleasure car chassis, with the exception that the battery is carried in a tray suspended below the frame. Bodies are of the open express type, on a wheelbase of 86 inches in the case of the smaller car and 96 inches in the case of the larger. The available loading spaces are 90 x 42 inches and 100 x 42 inches, respectively.

Ohio Electrics—Price Range, \$2,400—\$4,000.

Except for the addition of several new body styles, the Ohio line of electric pleasure cars remains practically without change as regards its mechanical construction. De-



OHIO ELECTRIC CONTROLS

tail refinements have been made, of course, but they are purely of a minor nature and though they are calculated to increase the uniformity of action of the whole, the distinctive magnetic control is employed, though in several of the models the location of the supplementary controller has been changed to the top of the steering wheel. The master controller, magnetically operated, is located on the chassis frame in an accessible place. One of the interesting features of this control, though it is not new, inasmuch as it has been in use for a number of years, is that the application of the brakes automatically turns off the power. By an ingenious arrangement, the power is not turned on immediately the brakes are released, as might be supposed. Instead the supplementary controller must first be returned to the neutral position before the power can be turned on again. The motor is mounted over the propeller shaft on the torsion tube and drives through the intermediary of a chain. Final drive is by means of a shaft and the orthodox type of bevel gearing. The battery equipment varies according to the type of body and the requirements of the purchaser from 30 to 41 cells of 13-plate Hycap Exide. Three new body styles have been added and these include an open Victoria, and two broughams, one of which is styled the Ohio De Luxe. The latter

body is by far the most luxurious creation which has been included in the line, and is finished and equipped accordingly. Barring the richness of its finish, its most distinctive feature is that it provides accommodation for five passengers, all of whom

Hupp-Yeats Electrics—Price Range, \$1,750—\$5,000.

Most conspicuous at the space where Hupp-Yeats electrics—which was the first of the low-hung electrics—are shown, is a most imposing and luxuriously appointed "De Luxe" coupe. Externally the lines are in pleasing variance to the usual straight-sided coupe and the effect approximates more nearly the Colonial type which is so much in vogue at present. Inside, the seats and backs are upholstered in deep maroon morocco, set off by buttoned and tufted satin roof decorations and especially designed laces. Throughout the car, both inside and outside, the metal parts are heavily gold plated, providing the finishing touch to what the manufacturers style one of the "most elegantly appointed electric coaches ever built." As luxurious as this coach is, however, there are two others listed but not exhibited which are even more so. They are styled the "Royal" limousine and the "Imperial" limousine, and as their names suggest, are larger cars than the de luxe coupe model. Otherwise, they are finished in much the same style. For the person of less expensive tastes, or with a pocket that is not so well filled, there is exhibited the standard type of coupe, and it differs not at all from the previous model. All of the cars are distinguished for their low hung appearance, gained by attaching the rear springs below instead of above the axles. As heretofore, the motor is encased in a unit housing with the differential and drives through bevel gearing and an extremely short shaft. The controller is of the Westinghouse continuous torque type and provides five speeds forward and two reverse. The battery varies slightly in size according to the different type of bodies, but in most of the models it consists of 27 cells of 11 plate Hycap Exide. The commercial vehicle which is displayed is a brand new addition to the line, though the chassis is the same as the standard pleasure car chassis, except that it is slightly different in shape and is heavier throughout. The car is rated at 1,000 pounds capacity and the loading space is 41 x 72 inches; with a screen side body and curtains it lists at \$1,600, and with a panel delivery body the price is \$100 more.

Columbus Electrics—

Displayed beside their gasoline engined cousins, the Columbus electric cars appear in a variety of bodies and in several chassis sizes. This is another line which, except for a general refinement of detail and a smoothing down, is substantially as it has been in years gone by. The most noteworthy of the slight alterations which have

been made embrace the adoption of a new style of rear axle construction, which provides more rigidity and greater bearing surface, the enlargement of the brake drums and the use of an I-beam section front axle of slightly different shape, providing for larger and more efficient wheel bearings. The equipment in all the models also has been altered and made more complete by the substitution of new style lamps and the addition of a mirror, to allow the driver to see behind him. Another of the clever equipment additions consists of an automatically controlled electric heater, by means of which the temperature in the various bodies may be maintained at a predetermined degree. The same type of General Electric fully enclosed motor is retained in all the models, though the method of drive in model 1222 now is by double reduction, in which the first reduction is obtained through herringbone gears instead of through a "silent" chain, as in the other models. Similarly, the controller and battery equipment is the same, the former being of the constant torque drum type,

and the latter consisting of 30 cells of 11 plate Hycap Exide.

Standard Electric—Price, \$1,850.

The Standard is another electric pleasure car which but recently has been placed on the market and in which there are embodied a number of features which are of an exclusive nature. The body is of the modernized coupe type and by reason of a long wheelbase, semi-elliptic springs in front and three-quarter elliptic members in the rear, pneumatic tires and the location of the battery in two sections front and rear under low and unobtrusive housings presents an appearance that suggests not a little the conventional type of gasoline engined car. There are two distinct advantages accruing from the features of long wheel base, and the location of the battery entirely outside the body. These are that the available amount of space in the body is exceptional, and that the care and charging of the battery does not necessitate the body being opened. Therefore it may be left with the doors locked to obviate

the possibility of the theft of robes or other property. Because of its relatively high efficiency under heavy load, a high-speed type of motor is employed and the drive to the rear axle is by shaft through a unique type of double reduction bevel and spur gearing. The propeller shaft is enclosed in a torsion tube which is attached at its forward end directly to the motor. The motor, however, is flexibly mounted by means of an encircling gimbal ring mounted in trunnions on either side of the frame, and thus is free to swing within certain limits to allow for such weaving of the frame as may take place under extraordinary conditions. The torque tube is stayed to the rear axle by means of diagonal braces which run to the outer ends of the axle, thereby rendering the whole construction essentially rigid. The controller is of the conventional hand operator constant torque type, and the remainder of the control elements are embraced in a side lever steering arm and double pedal control for the two sets of brakes.

Summary of the Pleasure Cars Exhibited in Grand Central Palace

Gasolene Pleasure Cars.

Abbott Motor Co., Detroit, Mich.—Seven four-cylinder Abbott-Detroit cars. One Berline, one coupe, three touring cars, two roadsters and two chassis.

Auburn Auto Co., Auburn, Ind.—Four Auburn cars. One six-cylinder touring car, three four-cylinder touring cars.

Bergdoll, Louis J., Motor Co., Philadelphia, Pa.—Six four-cylinder Bergdoll gasolene cars. Three touring cars, one open-front limousine, one roadster, one coupe and one chassis.

Clarke-Carter Auto Co., Jackson, Mich.—Three four-cylinder Cutting cars. Two touring cars, one roadster.

Cole Motor Car Co., Indianapolis, Ind.—Four four-cylinder Cole cars. One each touring car, coupe, raceabout and roadster, and one chassis.

Columbus Buggy Co., Columbus, Ohio—Five four-cylinder Firestone-Columbus gasolene cars. One each limousine and roadster and three touring cars.

DeTamble Motors Co., Anderson, Ind.—Three four-cylinder DeTamble cars. Two touring cars, one roadster and one chassis.

Fiat Auto Co., New York—Three Fiat cars. One six-cylinder touring car and one six-cylinder chassis, one four-cylinder touring car, one four-cylinder limousine and one four-cylinder chassis.

Great Western Auto Co., Peru, Ind.—Two four-cylinder Great Western touring cars and one chassis.

Hupp Corporation, Detroit, Mich.—Four four-cylinder Hupmobile cars. One each touring car, coupe, roadster and runabout and one chassis.

Hupp Motor Car Co., Detroit, Mich.—Three four-cylinder R-C-H cars. One each touring car, roadster, coupe and one chassis.

Havers Motor Car Co., Port Huron, Mich.—One six-cylinder Havers torpedo touring car.

Herreshoff Motor Co., Detroit, Mich.—Three four-cylinder Herreshoff cars. One each touring car, coupe and roadster.

Ideal Motor Car Co., Indianapolis, Ind.—Four four-cylinder Stutz cars. Two touring cars, one coupe, one roadster and one chassis.

Imperial Auto Co., Jackson, Mich.—Three four-cylinder Imperial cars. Two touring cars, one roadster.

Jeffery, Thomas B., Co., Kenosha, Wis.—Nine four-cylinder Rambler cars. Six touring cars, one Berline, one limousine, one roadster and one chassis.

King Motor Car Co., Detroit, Mich.—Two four-cylinder King gasolene cars. One each touring car and coupe and one chassis.

Kline Motor Car Corp., York, Pa.—Five four-cylinder Kline cars. Four touring cars and one roadster.

Krit Motor Car Co., Detroit, Mich.—Three four-cylinder underslung Krit cars. One touring car and two roadsters.

Lion Motor Car Co., Adrian, Mich.—Four four-cylinder Lion cars. Two touring cars, one raceabout, one roadster and one chassis.

McFarlan Motor Co., Connersville, Ind.—Three six-cylinder McFarlan cars. One roadster, two touring cars.

Marion Sales Co., Indianapolis, Ind.—Five four-cylinder Marion cars. Three touring

cars, two roadsters and one polished chassis.

Metz Co., Waltham, Mass.—One four-cylinder friction-driven Metz runabout and one chassis.

Michigan Buggy Co., Kalamazoo, Mich.—One four-cylinder Michigan touring car.

Middleby Auto Co., Reading, Pa.—Two four-cylinder Reading cars. One each touring car and roadster and one chassis.

Motor Car Mfg. Co., Indianapolis, Ind.—Three four-cylinder Pathfinder cars. One each coupe, roadster, touring car and one chassis.

Ottomobile Co., Philadelphia, Pa.—Three four-cylinder Otto cars. Two touring cars, one roadster and one chassis.

Paige-Detroit Motor Car Co., Detroit, Mich.—Six four-cylinder Paige-Detroit cars. Three touring cars, two roadsters and one coupe.

Paterson, W. A., Co., Flint, Mich.—Two four-cylinder Paterson touring cars.

Penn Motor Car Co., Pittsburgh, Pa.—Five four-cylinder Penn cars. Two raceabouts, two roadsters, one touring car and one chassis.

Regal Motor Car Co., Detroit, Mich.—Four underslung and one overslung four-cylinder Regal cars. Three touring cars, one roadster, one coupe and one chassis.

Stuyvesant Motor Car Co., Cleveland, Ohio—One four-cylinder Stuyvesant touring car, and one chassis.

Velie Motor Vehicle Co., Moline, Ill.—Five four-cylinder Velie cars. Three touring cars, one raceabout, one roadster and one chassis.

Warren Motor Car Co., Detroit, Mich.—Four four-cylinder Warren-Detroit cars.

Your Thumb and Finger With The DISCO

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Most of the above manufacturers are equipping all their cars, using DISCO Starters as Standard Equipment. The others are supplying DISCOS as Extra Equipment. Many leading manufacturers are practically ready to adopt the DISCO and as fast as possible their names will be added to the above list.

The deadly parallel below tells the story. The little handle on the dash of your car is turned once around with thumb and finger, then you press the button and the engine runs.

No matter how cold the weather—no matter how long your car has stood—DISCO acts certainly—quickly—positively. It not only starts the motor—it keeps it, just as the firing of the cylinders with gasoline vapor warms them. For this reason it is the ONLY practical system for cold weather, when merely turning the key over is “vain repetition.”

You Could Run Your Car Without Gasoline

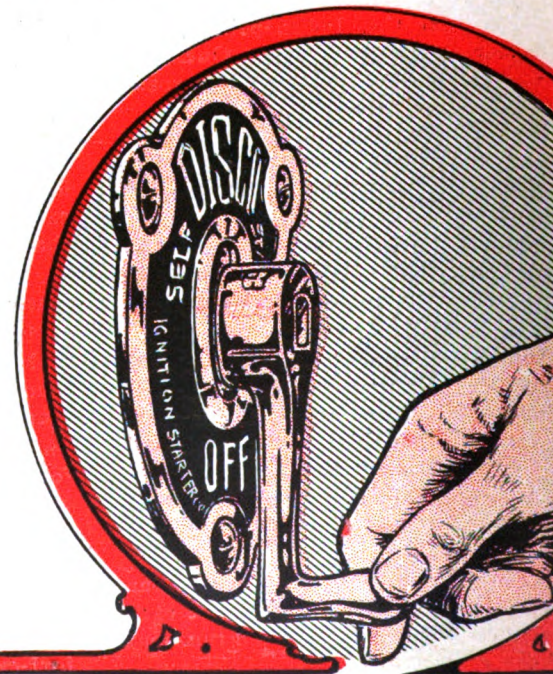
The power which the DISCO applies is the dependable acetylene gas from your lighting gas tank—the same convenience that you depend on for lighting your lights. While not so powerful as gasoline, even when mixed in the most exact proportions, acetylene gas is nevertheless a uniformly dependable power. It is in fact used instead of gasoline to operate your motor.

The DISCO Starter is so arranged that if, because of extreme cold or faulty operation, the engine does not continue to run after the DISCO starts it, it can be turned again and again, or it will keep the motor running an indefinite time. The DISCO is not only a REPEATER—it is also a power in itself and cars have been run for ten or six miles without the use of a drop of gasoline.

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Simple isn't it? Six thousand and more in actual use prove its success.

**AT THE
CHICAGO SHOW**



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The extreme simplicity and absolute reliability of the DISCO SELF STARTER explain its adoption by the experts of the Motor Car World. It has been welcomed by the largest and most progressive manufacturers—by the leading dealers—by the most experienced owners and drivers as well as by new owners who have observed and studied conditions.

You can buy the DISCO from any up-to-date dealer. If they haven't it in stock, they can quickly get it, for we make prompt shipments. The DISCO can be applied to ANY car in less than three hours' work, by any man of average ability. Here is one of the secrets of its wonderful success:—

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There is no longer excuse for the back-breaking work at the crank, in all kinds of weather. There is no danger of broken bones. If you drive a party of friends to the theater you do not need a chauffeur to avoid the embarrassment of laboring awhile at that pesky handle before you start home.

A lady can now drive the heaviest machine without fear of being "stalled" and having to crank the car herself. It is the biggest improvement made in gasoline cars since the year one.

Big Scramble for Territory—Dealers Act Now

There is still an opportunity for dealers to get in right on the biggest accessory business in the history of the automobile. See the DISCO at the Chicago Show, or write quick to our home office at Detroit for terms.

You only lose sales by waiting. Our patents made infringement impossible—and unless you wait till some one steals our invention bodily, you CANNOT GET ITS EQUAL. There will be plenty of imitations—but only one DISCO. Get in touch with us—and do it NOW.

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THE MOTOR WORLD

Three touring cars, one roadster and one chassis.

Westcott Motor Car Co., Richmond, Ind.—Four Westcott gasoline cars. One each torpedo and roadster, two touring cars and one chassis.

Electric Pleasure Cars.

Argo Electric Vehicle Co., Saginaw, Mich.

—One Argo coupe.

Columbus Buggy Co., Columbus, Ohio—

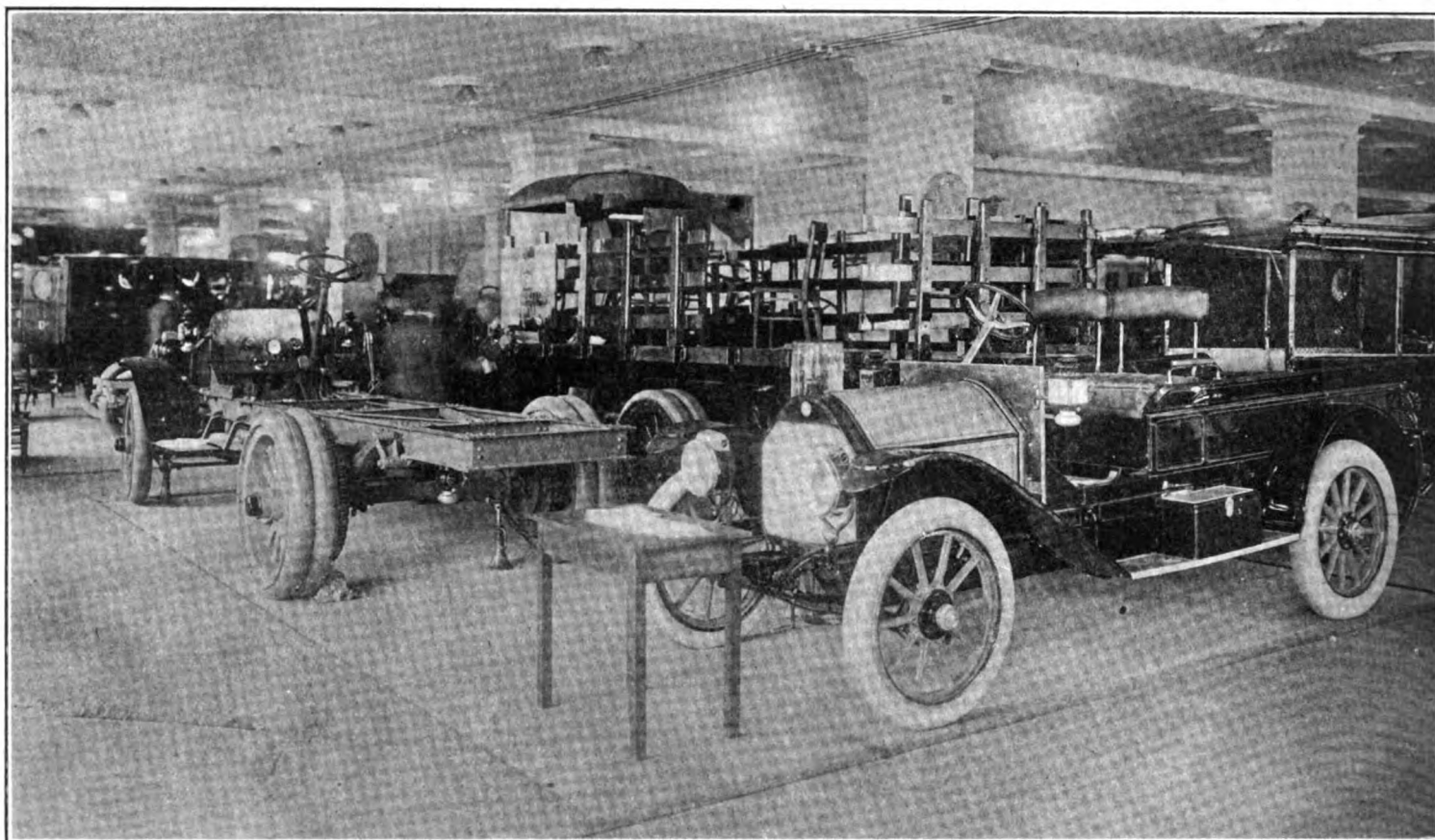
Two Firestone-Columbus electric coupes. Hupp Corporation, Detroit, Mich.—Two

electric Hupp-Yeats coupes and one chassis.

Ohio Electric Car Co., Toledo, Ohio—Two Ohio coupes, one chassis.

Standard Electric Car Co., Jackson, Mich.—One Standard coupe and one chassis.

The Trucks in Grand Central Palace and Their Principal Characteristics



TYPICAL VIEW IN THE TRUCK DEPARTMENT—VELIE EXHIBIT IN THE FOREGROUND

Despite the presence of a few really big, powerful trucks—"brutes"—the commercial vehicle section of the Grand Central Palace automobile show was essentially an exhibition of light machines—delivery wagons and trucks of less than two tons capacity. Ranging from the little tricar built to scurry around with five or six hundred pounds in its box up to a full grown delivery wagon that, with an appropriate body, could almost aspire to the dignity of a truck, the smaller vehicle held full sway, not only predominating numerically, but furnishing the greatest variety of designs and including most of the newcomers who had their cars on view for the first time.

Not that the big cars did not make a good showing. They did, and their bigness was emphasized and magnified by the small machines that surrounded them on all sides. But they were greatly in the minority; the five-tonners had but few representatives, and only one, a foreign production built to carry seven tons, was bigger.

What they lacked in numbers they made up in quality, for without exception the "giants" were fine examples of the truck builder's art.

In the heavy trucks new features, constructional changes and unique devices were rare; heavy machines move slowly, in every sense of the word. But the light wagons supplied plenty of new "points," and they developed certain tendencies that are at least interesting, whether they are particularly significant or not. For instance, the left-hand position of the steering wheel was shown by no less than 13 makers, most of whom also placed their control levers in the center. It seems probable that another year will see a considerably greater proportionate number of left-hand steered cars, for while all the "left-hand" advocates are thoroughly satisfied that their placing of the wheel is correct, many of the "right-handers" are willing to fit left-hand steer on special order, some are contemplating changing over later on and others are "on the fence."

waiting to see which way the wind will blow.

No automobile show would be complete without its air-cooled motors, and the absence of representatives of the two-stroke faith would leave a void that would be notable. The Palace show was orthodox in these matters; but it went a step further, for all but one of the air-cooled motors were of the two-stroke kind, and all but one of the two-stroke motors were air-cooled. While this might be construed to mean that there were but two of each, such is not the case, for there were six makes of air-cooled cars, five of them two-stroke, and but one of the two-stroke motors was water-cooled. One of the air-cooled motors was a four-stroke machine. To add a little more to the curious situation, there were no four-cylinder air-cooled motors and no four-cylinder two-stroke motors; but two makers exhibited cars with three-cylinder, two-stroke, air-cooled engines.

The single-cylinder motor had no place in the Palace commercial exhibit; neither

were there any six-cylinder motors—which, however, are very rare in machines of this class. Lubrication of motors has reached a point where all but a very few makers use the so-called “self-contained” or “recirculating” systems; all the two-stroke motors except one are lubricated by the simple and efficient method of mixing oil with the gasoline; the exception is the water-cooled two-stroke motor.

While the selective sliding gear for speed changing was dominant even in the smaller cars, the planetary gear was represented and the friction drive was quite conspicuous, though confined to the lightest class of wagons, for which it seems well adapted—which does not mean that it is unsuited to heavier machines, however. Another type of transmission employed small rollers acting directly on large rings bolted to the rear wheels of the vehicle, the rollers being carried on extensions of the crankshaft of the motor—an arrangement that was unique in itself, but which was only one of the unusual features of the wagon, which had a two-cycle air-cooled motor with two cylinders and the flywheel between the cylinders. The whole power and transmission system—motor, shaft and rollers—was shifted in order to withdraw the rollers from contact with the wheel rings and so cut off the driving power from the wheels. In order that the show might be quite complete, there was an example of the gear drive enclosed in the wheels, the drive being balanced to avoid side thrust, and the power an electric motor; and there also was a sort of modified double turbine arrangement driving through the medium of a heavy oil acting and reacting on turbine blades.

Taken as a whole, the show was full of interesting things, and it is noteworthy that not a few of the features that were called “freaks” a few years ago are still “doing business” and gaining recognition as really useful members of the genus mechanism.

As was the case in the pleasure car section of the show, quite a number of commercial car exhibitors who were scheduled to show vehicles did not put in an appearance while, per contra, several who were not on the published lists occupied spaces in the big building.

Federal Trucks—Capacity, All Models, 1 Ton; Price Range, \$1,800—\$1,950.

Confining itself to one type of chassis built in a single size, the Federal company has bent all its energies to bringing that type to a high state of development, and the result is seen in a number of details which, though not of a startling nature, are well suited to the end for which they were intended. The only variation in the construction of the chassis is in the length of the wheelbase, two lengths being provided, 110 inches and 144 inches respectively. The motor, of the four-cylinder, water-cooled, pair-cast, L-head type, has cylinders of 4¼-

inch bore by 4½-inch stroke and develops its rated output, 30-horsepower, at 1,000 R. P. M. A leather-faced cone clutch is employed. The three-speed selective slid-

the ends of the jackshaft housing are carried, secured by retaining screws. By removing these screws the unit is dropped complete, and can be removed after being moved backward until it is free of the universal mounting in the front. Following a practice that is common among builders of trucks designed for hard work, the drive is taken through radius rods and not through the springs; the rods are provided with joints permitting movement in any direction, and threaded adjusters permit accurate and easy adjustment for length. Twenty-point carbon steel channel, 4½ inches deep, is used throughout for the framing, including the cross-members, and the corners are braced by heavy steel gusset plates. Semi elliptic springs are used all round, those in front being 40 inches long and the rear springs four inches longer. In general form, the Federal truck is of the type having the motor in front of the dashboard, under a hood. While it is not a heavy machine, still it is not too light for strength and durability.

Gramm trucks that the builders consider Tons; Price Range (Chassis), \$2,000—\$4,500.

Massive construction, moderate wheelbase, motor under the footboards and short overhangs characterize all the chassis—one, two, three and five-tons capacity—manufactured by the Gramm company, and though there is every indication of strength and solidity in all of the parts, the weights are moderate, considering the ability of the machines to stand rough usage. All models are practically alike excepting in the matters of dimensions and horsepower, and the number of speeds provided for, the two smaller sizes having three speeds forward and the two larger four speeds, all having selective sliding gears. Motors are four-cylinder water-cooled, with cylinders cast in pairs; and though cylinder heads, water jackets and valve chambers are cast integral with the cylinders, there are separate removable heads or cover plates for the water jackets, the object being to make the core-setting process more accurate and ensure cylinder and jacket walls of uniform thickness. There are two features of the Gramm trucks that the builders consider particularly important. One is the shortness of the rear overhang, which makes for ease of handling in crowded traffic, and the other the roller spring suspension. The front ends of the front springs are secured to brackets riveted to the main framing; the rear ends of the front springs, as well as both ends of the rear springs, are fitted with hardened steel rollers working in steel guide-plates directly under the main frames. The frames thus are given the maximum freedom of movement. All driving stresses are transmitted to the frame through heavy radius rods, the springs being relieved of this duty.

Gramm trucks which earned their reputation years ago, are listed without bodies,

CENSUS OF THE PALACE SHOW

Total Exhibitors	138
Exhibitors of Vehicles.....	69
Exhibitors of Accessories..	69

PLEASURE CARS

Gasolene—	
Four Cylinders	122
Six Cylinders	6
Total Gasolene Pleasure Cars..	128
Roadsters	39
Touring Cars	73
Coupes	10
Limousines	4
Berlines	2
Chassis	25
Electric—	
Coupes	7
Chassis	3
Grand Total of All Pleasure Cars and Chassis	163

COMMERCIAL VEHICLES

Gasolene—	
Two Cylinders	6
Two Cylinders (two-cycle)..	7
Three Cylinders (two-cycle)..	7
Four Cylinders	38
Chassis—	
Two Cylinders	2
Two Cylinders (two-cycle)	2
Three Cylinders (two-cycle)	2
Four Cylinders	20
Total Gasolene Trucks and Chassis	84
Water-cooled	68
Air-cooled	16
Electric—	
Trucks	5
Chassis	2
Total Commercial Vehicles and Chassis	91

ing gears are enclosed in a casing which forms part of the jackshaft housing, and the entire unit—jackshaft, housing, gear-case and gears—can be removed without disturbing the jackshaft itself. Two U-shaped brackets, with open ends down, are secured to the main frames, and in these

owing to the diversity of requirement in this matter, and bodies are built specially for each machine, to suit the work for which it is destined; the company maintains a fully equipped body department. One of the bodies exhibited was a dumping body on a 5-ton chassis. The body was hinged

help seeing it. The oil flows in a large stream and any cessation can be seen instantly. All the oil piping is extremely large—in fact, it looks too large, except to the eye of the experienced. A leather-faced cone clutch, of the simplest type, but well designed and using chrome-tanned

the engagement of the clutches only when the engine speed is at the proper point with relation to the speed of the car. If the driver desires to change to any particular speed, he moves a short lever under the steering wheel to the desired notch. If the conditions are right the governor will permit the desired gears to become engaged; otherwise there is no change, and the driver must change the speed of the truck or else try another gear notch before he can make a change. This prevents the changing of gears when there is too great a difference between the speed of the car and the speed that would be given by the gear sought to be engaged.

Kelly Trucks—Capacity Range, 1—3 Tons; Price Range, \$2,800—\$3,300.

Retaining the distinctive air-cooling system that has distinguished it from the beginning, the Kelly truck, formerly known as the Frayer-Miller, presents a striking appearance when the motor is exposed so as to show the big blower, which sends cooling air to the motor cylinders. There has been practically no change in the Kelly motor for years, except in the matter of detail. The principal feature still is the aluminum cylinder jacketing connected by a conduit with the large rotary blower driven by "silent" chain from the engine shaft, large volumes of air being forced through the jackets, thoroughly cooling the cylinders. Valves are of the overhead type,



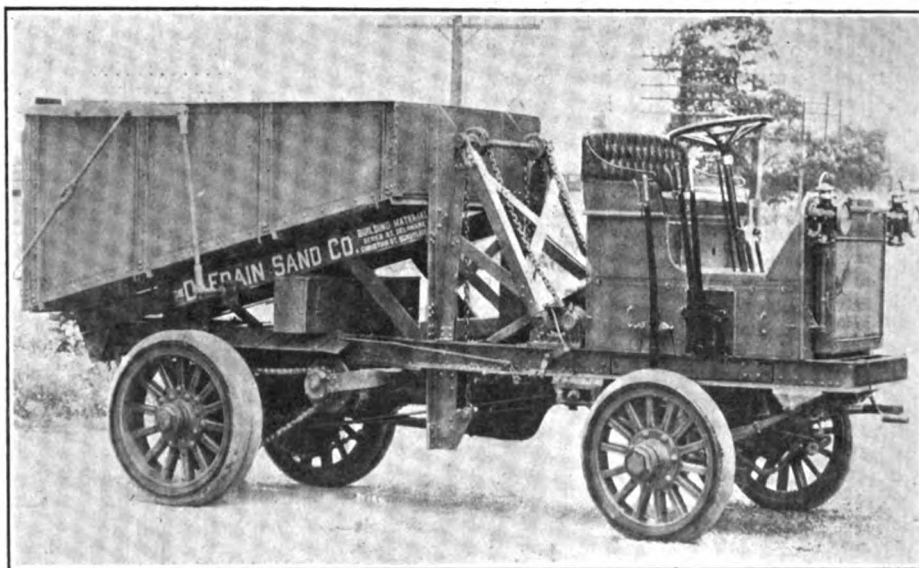
OPEN EXPRESS BODY ON THREE-TON GRAMM CHASSIS

at the rear end and was lifted from the front by a chain-and-windlass mechanism driven from a special shaft extending from the gearbox, through worm and spur gears. The hoisting device can be used whether the truck is standing still or under way, there being a separate clutch for the purpose. A series of levers opens the rear door when the body is hoisted, the idea being that this feature will be useful for distributing material—road material, for instance—over a considerable area if desired. No changes have been made in the Gramm line during the past year.

Commer Trucks—Capacity Range, $4\frac{1}{2}$ — $6\frac{1}{2}$ Tons; Price Range, \$4,500—\$5,200.

Like many another good thing, the Commer truck has nothing much in its general appearance to distinguish it from a score of other motor trucks, and more than a casual glance is required to find the reason for the unquestionable success of the machine. In its general design the Commer may be said to be of a conventional type; but in many of its details it is decidedly out of the ordinary. The motor is hung directly on the main frames and has four pair-cast cylinders. Two motor sizes are used, one of 40-horsepower, having cylinders of 4 5-16 inches bore and $5\frac{1}{2}$ inches stroke, and the other, rated at 48-horsepower, having cylinders of $4\frac{3}{4}$ inches bore and $5\frac{1}{2}$ inches stroke. Lubrication is effected by a self-contained recirculating system, and the crankcase reservoir holds a very large quantity of oil so that replenishing is required only at very long intervals. Every drop of oil that is pumped passes through a sight-feed on the dashboard, so located that the driver cannot

leather which resists the action of water and heat, is used, and the change-speed gear-set gives three forward speeds. Between the clutch and the gear-set there is a sort of jaw clutch with very heavy rub-



GRAMM TRUCK EQUIPPED WITH POWER DUMPING BODY

ber blocks between the jaws; the rubber takes the torque impact and provides a cushioning effect that saves the whole car from shocks and jars.

The most conspicuous feature of the Commer truck is its gearset. This has its gears in mesh at all times and gear changes are made by means of dog clutches which serve to connect the individual gears to their shafts as may be required. The system is made almost fool-proof by the use of a centrifugal governor which permits

operated by long pushrods and rocker arms, and the exhaust valve chambers are exposed to the current of air and cooled, just as the valves of a water-cooled motor are jacketed and water-cooled.

Apart from the peculiar design of the engine, the Kelly truck follows what are practically standard lines, driving through multiple disk clutch, four-speed selective sliding gears and floating jackshaft to the rear wheels, the final drive being by side chains. In the smallest machine, the one-

ton model, the motor is placed forward of the dashboard under a hood, while in the iwtwo larger cars it is under the footboard and seat.

Walter Truck—Capacity Range, 1½—5 Tons; Price Range, \$2,800—\$4,500.

No less than six different chassis models are manufactured by the Walter company and all use four-cylinder motors of a design worked out especially for this machine. Ordinarily the 1 and 1½-ton trucks are fitted with 24-30-horsepower motors, the 3-ton trucks of which there are two models, with 30-35-horsepower motors and the 3½ and 5-ton trucks with 35-40-horsepower motors. These arrangements may be varied, however, where the service makes it advisable to install higher power in a car for heavy hill work for instance

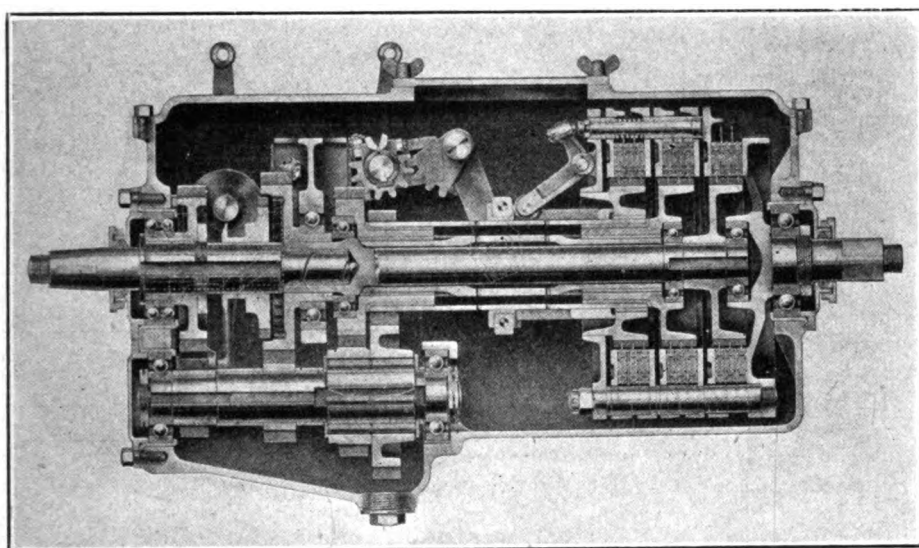
another gear engages with a gear on the tail-shaft, which is connected by a universal joint to the propeller shaft. Further movement of the operating lever carries the compression further, and the second clutch is engaged, without releasing the first, however. The second clutch drives another sleeve, inside the first, and it also carries a gear and drives the countershaft and tail-shaft in the same way as the first speed gearing, the difference being that the gears in the second set are proportioned to give higher speed at the tail-shaft. In order to prevent locking, the driven gears on the countershaft are on roller clutches, so that when the second speed is engaged the first speed roller clutch overruns. On third speed drive is direct, first and second gears on the countershaft overrunning on their roller clutches. When speeds are changed

course, the motors vary in horsepower, running from 25 horsepower for the small wagon to 60-horsepower for the 5-ton and 7-ton trucks, and the various parts are proportioned for the service expected of them. Motors are placed under hoods, out in front, in the 1,500 pound wagon and in the two-ton truck, while the one, three, five and seven-ton trucks have their engines under the floorboards. In all models the transmission system includes multiple disk clutch, three-speed selective sliding change speed gears, jackshaft and side chains; in all except the two smaller models, a cone clutch will be substituted if so desired by the purchaser. The motors used are built by the Hazard and the Herschell-Spillman companies. Solid tires are employed throughout the line. The Victor company has manufactured considerable motor fire apparatus, chiefly ladder trucks, though no vehicles of this type were exhibited at the Palace.

Aries Trucks—Capacity, 7 Tons; Price \$6,000.

The French Aries truck at the Palace was distinguished in three respects. It was the largest and most massive thing on wheels in the Palace; it was the only foreign-made commercial vehicle shown; and it was alone in the use of steel tires, not as special equipment on one truck, but as a regular thing. This feature is urged as a satisfactory solution of the tire problem, though the Aries people will provide rubber tires on special order. Everything about the truck is big, but the ponderous, thick-spoked wheels, almost solid structures of wood, seemed to catch the eye first. The enormous strength of the machine is necessary, not only to enable it to carry the seven-ton loads for which it is designed, but to withstand the shocks and jars and the severe vibration resulting from the pounding of the steel tires on uneven road surfaces. Naturally, particular attention has been bestowed upon the springing of the car, and the semi-elliptics used are very long and flexible at the ends, and made with very little "set"—in other words, they are almost flat.

So far as the general arrangement of the power plant and the transmission mechanism is concerned, there is nothing unusual about the Aries machine; it has, however, that indefinite, intangible appearance of being well built of good material that somehow distinguishes the better class of French cars. This cannot be attributed to finish, for the Aries truck is not highly finished; but nevertheless it is there and it is unmistakable. The engine, having four cylinders cast in pairs, is rated at 40-horsepower, the cylinder bore and piston stroke being 5 inches and 5¼ inches respectively. Cylinders are of the T-head type, and the oiling system includes an oil pump which forces oil through the drilled crankshaft to the various bearings. An unusual construction is found in the crankcase, which



WALTER "CONTINUOUS TORQUE" CHANGE GEAR MECHANISM

All motors have L-heads and pair-cast cylinders, are water-cooled and have self-contained lubricating systems, with the oil circulated by cam-driven pumps. Selective gear-sets, giving three forward speeds, and final drive by side chains also are features of all the machines, from the smallest to the largest. In all models the wheels are larger than is usual, the diameter in the larger machines being 48 inches.

While one of the trucks shown at the Palace was equipped with a selective sliding gear-set, which heretofore has been standard with the Walter company, the other had a change speed gear of a new type—the Westinghouse gear, in which the gears, giving three speeds and reverse, are always in mesh and are engaged by individual clutches of the multiple disk type mounted on concentric sleeves. The gear is operated by the progressive movement of a lever, which engages the clutches in succession. The first movement of the lever compresses the disks of the low-speed clutch, which is caused to rotate carrying with it a sleeve, on the opposite end of which is a gear meshing with a countershaft gear. Further along the countershaft

with this gear the transition from one speed to another is not perceptible, the slipping of the gradually gripping disks and the overrunning of the roller clutches in the countershaft gears causing the change to be smooth and progressive. The entire mechanism, including the clutches, is enclosed in a single casing and the shafts and sleeves run on annular ball bearings.

Though the Westinghouse company has for some time been engaged in experimenting with this change-speed gear, it only recently has placed it on the market. The apparatus is built at the Pittsburgh shops of the company. The Walter company has adopted the new gear as standard and will use it in all cars that will be manufactured hereafter.

Victor Trucks — Capacity Range, 1,500 Pounds—7 Tons; Price Range, \$1,700—\$5,850.

An unusually wide range of carrying capacity is covered by the productions of the Victor Motor Truck Co., which recently acquired a fine new factory in Buffalo, and the same general mechanical features are carried throughout the line; though, of

is of steel throughout, giving great strength—much greater than the usual aluminum. In fact, aluminum is not used in any part of the Aries truck, the makers believing it too weak for such service. The clutch is a special truck clutch having alternate plates of bronze and steel, running dry. Three speeds and reverse are provided by the gear-set, which, with the differential gear and the jackshaft, is enclosed in a cast steel housing having a strength in keeping with the other parts of the machine. Final drive is by heavy side chains.

The construction of the Aries wheels is a most unusual process. The wood spokes are of air-dried wood, each spoke cut with the natural grain; and the felloe is made up of small sections of French elm, a wood that is of great hardness, and of such close and compact grain that it will not float in water. But the most interesting feature is the making and applying of the tire. This is made from a solid billet of Creuzot steel, which has been found to be of exactly the right temper for tires. The chemical properties of this steel do not permit it to be welded, so the billet is pierced and mandrels are driven through, expanding the metal by successive stages, until it can be placed between heavy rolls. The rolling process is continued until the tire is of the proper diameter and thickness, and the edges are then trimmed in a lathe. As further heating would injure the steel at this stage, the tire is forced on the wood wheel by heavy hydraulic presses, and the wheel is then placed in another press consisting of a series of hydraulic rams which act upon the surface of the tire, pressing toward the hub. The rams, working at enormous pressure and in unison, gradually compress the steel and reduce the diameter of the tire, until finally it is so closely bound to the wheel that it is practically part of it, and its removal without the destruction of the wheel is practically impossible. The makers guarantee a mileage of 60,000 miles and state that none of these tires have yet been worn out in service.

Dayton Trucks—Capacity Range, 1½—5 Tons; Price Range, \$2,500—\$4,500.

Long-stroke motors, left-hand steering and center control are features of the Dayton trucks, which follow well-established trends and are entirely devoid of "stunts" or spectacular features. The motor, with four water-cooled cylinders of the T-head type, is placed under the footboard and drives through a Hele-Shaw multiple disk clutch, three-speed selective sliding gears and full floating jackshaft, with side chains for the final link of the transmission. Two distinct ignition systems are employed, one including a Bosch high-tension magneto and the other batteries with 4-unit coil and timer. These features are common to all sizes of Dayton trucks. Three engines are used. In the 1½-ton truck the motor is of 30-horsepower, with cylinders of 4¼

inches bore and 5 inches stroke; in the 3-ton truck the motor is of 45-horsepower, and has a bore and stroke of 4¼ and 5½ inches respectively; and in the largest car, carrying a load of 5 tons, the motor is rated at 60-horsepower, its bore and stroke being 5¼ and 7 inches respectively.

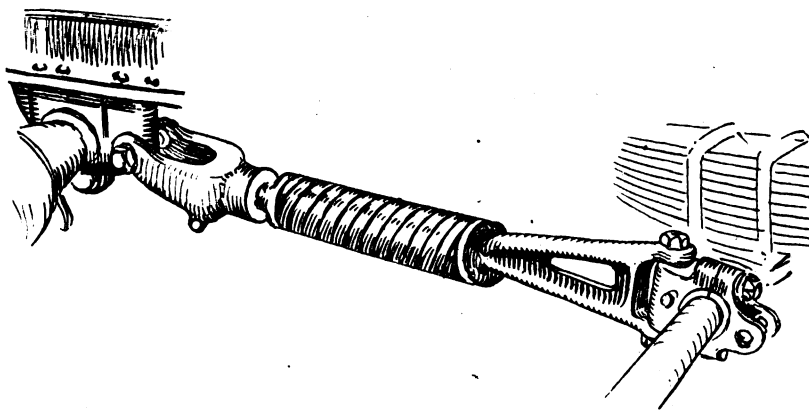
Velie Trucks—Capacity Range, 1,500 Pounds—3 Tons; Price Range, \$1,600—\$3,500.

The two larger Velie models, a two-ton and three-ton truck respectively, are noticeable for their extremely well braced main frames. The steel used is of I-beam section instead of the usual channel, and is of deep section with unusually large gusset plates at the corners and diagonal braces that give great stiffness. But the machine has other points of interest, though in its general design it is of the

is saved much of the jarring and racking it otherwise would receive. The rear axle is of remarkably heavy construction, being of round steel four inches in diameter, solid, in the three-ton truck and of steel tubing four inches in diameter in the two-ton machine. The height of the frame, without load, is only 36 inches from the ground, this being permitted by the carrying of the springs outside the frames instead of directly underneath. Prest-O motor starters are standard on Velie trucks.

Lauth-Juergens Trucks—Capacity Range, 1—3 Tons; Price Range, \$1,950—\$3,400.

The Lauth-Juergens truck, built in one, two and three-ton sizes, is not conspicuous because of any one feature, or for peculiarities of design. Rather it is a substantial vehicle, built in accordance with principles that are well established and can be



VELIE SPRING RADIUS ROD CONSTRUCTION

conventional motor-in-front type with disk clutch, three-speed sliding change speed gears and final drive by side chains.

Though the motor is of 4¼ inches bore and 5½ inches stroke, the change-speed gear is of the proportions commonly used to transmit about 60-horsepower, the idea being to give a wide margin of strength. The countershaft is carried out from the gearbox so that a sprocket can be attached for the purpose of driving a power hoist or, for that matter, anything that could be driven in this way. Another useful device is a differential lock which, by the pressure of a pedal on the footboard, locks the differential so that the rear wheels turn as if on a solid axle. This enables the car to be pulled out if one wheel gets into deep mud, for instance, and the other rests on slippery ground so that the differential gear permits one wheel to spin idly while the other is held fast. Unusual attention has been given in the Velie truck to the designing of the radius rods through which the driving stresses are transmitted to the frame from the rear wheels. Instead of being rigid when subjected to endwise pressure, they are made with telescopic joints held open by heavy helical springs. Sudden application of the power, instead of transmitting severe shocks, are cushioned by the springs, and the machine

relied upon. All three models—one, two, and three tons—are of the same general appearance, having their motors under the footboards. Particular care has been taken in the design and manufacture of the gear-set, which is built in the Lauth-Juergens factory—and which gives four forward speeds. The shafts are mounted on Hess-Bright annular ball bearings, and thrust is taken on balls also. Gear-set and jackshaft housing form a unit. The same gear-set is used in all three trucks. The clutch also is a special production of the Lauth-Juergens factory, being a patent three-disk friction that is simple in construction, compact and effective.

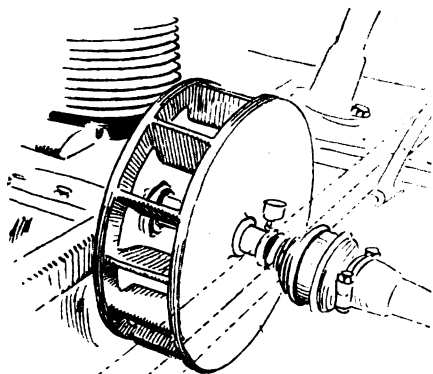
Rutenber motors are used, of 25-30-horsepower for the one-ton truck, 35-40-horsepower for the two-ton truck, and 40-45-horsepower for the three-ton truck. Two separate ignition systems are fitted, one with high-tension magneto and the other with a battery and coil system, there being two separate sets of plugs. The frame in the one-ton car is of angle steel, trussed, while in the two larger cars rolled channel steel is used, with angle steel cross-members, all hot riveted. Springs are semi-elliptic in all cases.

A completely enclosed driver's seat was a feature of one of the trucks shown at the Palace. This had glass windows all around

so that the view of the driver cannot be cut off in any direction. The idea of the builders is that a driver who is properly protected in cold weather will give much more efficient service than one who is exposed, and he will stick to his truck and his work, when the driver without protection would be looking for the shortest path to a warm and comfortable saloon where he could thaw himself out while the truck stood idle. The Lauth-Juergens trucks can be fitted with bodies of any type; stock construction includes a platform body.

Chase Delivery Wagons—Capacity Range, 1,500—3,000 Pounds; Price Range, \$1,400—\$1,900.

Notwithstanding the widespread prejudice against two-cycle motors, to say nothing of more or less feeling of antipathy toward air-cooling, the Chase motor wagons, which are equipped with three-cylinder, two-cycle, air-cooled motors have shown themselves to be worthy because of



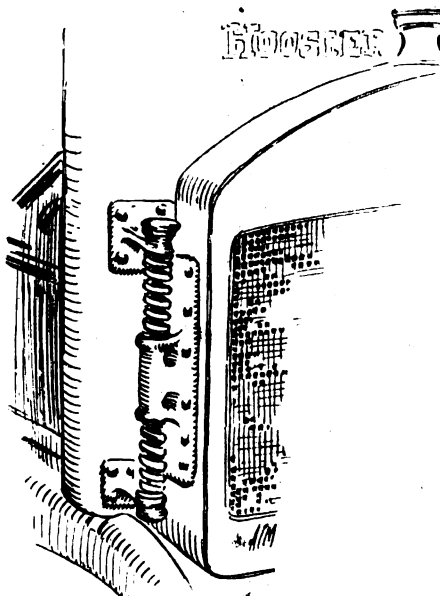
CHASE FAN FLYWHEEL

the number in use and the excellent work they have done. After it has been said that the motor is carried in front of the car in a dust-proof hood, lubricated by oil mixed with the gasoline; that transmission is through a cone clutch with cork inserts, three-speed selective gear-set and side chains to the rear wheels, there is little that can be said about the car, for its leading characteristic is simplicity. Front springs are full elliptics and rear springs semi-elliptic; the machines are light for their power, which is due partly to the simplicity of the motor and partly to careful construction. Chase wagons until recently have been built only up to 2,000 pounds carrying capacity, but at the Palace a new model of 3,000 pounds capacity was shown for the first time. It does not differ in any essential detail from the smaller cars, though being built for heavier service, it is built of heavier material.

Decatur Trucks—Capacity, all of 1½ Tons; Price Range, \$2,200—\$4,000.

Its western origin suggested by its name, "Hoosier Limited," the truck built by the Decatur Motor Car Co. embodies several features that indicate originality in some-

thing more than name. The striking feature of the vehicle which is built in one chassis size only, is the manner in which its power plant is made accessible. The object of the designer was to combine, as far as possible, the advantages of the accessibility of the motor placed forward under a



DECATUR SPRING RADIATOR SUPPORT

hood with those of the compactness and short wheelbase possible with the motor placed under the footboard. The motor, a four-cylinder 30-horsepower Rutenber, is placed under the footboard and made accessible by hanging the radiator on hinges, so that it can be swung open like the door of a safe, and by making the entire superstructure removable in two sections. Four bolts removed, the seat, with side panels and sideboards, can be lifted off. Four more bolts, and the framework of the seat, carrying with it the cylindrical gasoline tank, control levers, pedals, dashboard and radiator can be removed, leaving the engine at least as accessible as in a car of the motor-in-front type, and in condition to be quickly taken out.

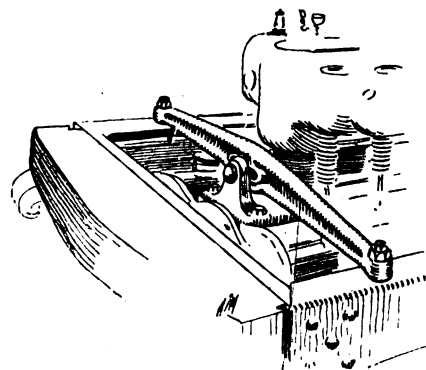
Transmission from engine to rear wheels is through multiple disk clutch and three-speed selective change speed gear, full floating jackshaft and side chains. Radius rods are made with two swiveling joints which give the effect of a full universal joint, to allow for movement in all directions and prevent bending stresses and consequent breakage. The rear spring system is somewhat peculiar in that, in addition to a three-spring platform system, there is a cross spring extending from center to center of the main rear springs, its ends just above flat plates bolted to the tops of the main springs and clearing them by about half an inch. The center of this auxiliary spring is clipped to a cross frame. The idea is that when a heavy load is carried the auxiliary spring comes down on the plates on top of the main springs and helps to carry the load, while, when the truck is

running light, the auxiliary is clear and the spring action is free and easy. Rollers on the ends of the auxiliary spring prevent undue friction and wear.

This truck, which is of exceptionally substantial construction throughout, is the only successor of a somewhat numerous line which was abandoned last season in favor of one type, upon which the energies of the concern now are concentrated.

Universal Trucks—Capacity, All Models, 3 Tons; Price Range, \$3,200—\$3,375.

A number of manufacturers of trucks of medium carrying capacity apparently have developed their trucks to a point where there is very little radical difference between them; they have become standard types, established by experience and the "survival of the fittest" and embody nothing that is in any way unusual. Of such a character is the three-ton Universal truck which, while differing from others of its class in minor details, has the same general features—four-cylinder motor under the footboard, multiple disk clutch which



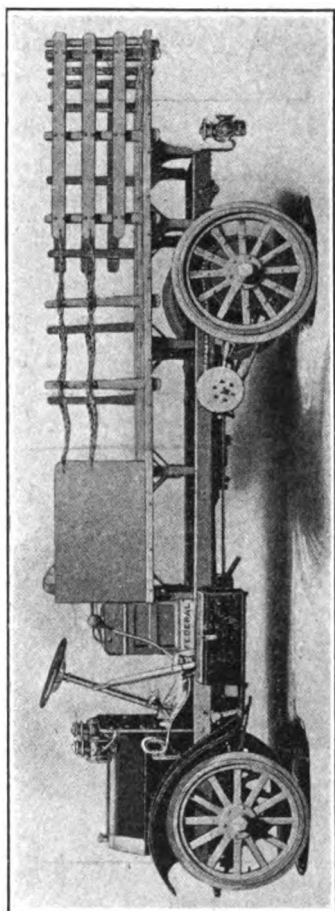
UNIVERSAL MOTOR SUPPORT

with its housing forms a unit with the jackshaft and differential casing, and final drive through side chains. The motor of the Universal is of the long stroke type, the cylinder bore and piston stroke being 4 inches and 5½ inches respectively; cylinders have T-heads and are cast in pairs and water-cooled by pump circulation. The horsepower is rated at 30 at 900 R. P. M. The clutch has dry plates and is designed to be unaffected by weather conditions.

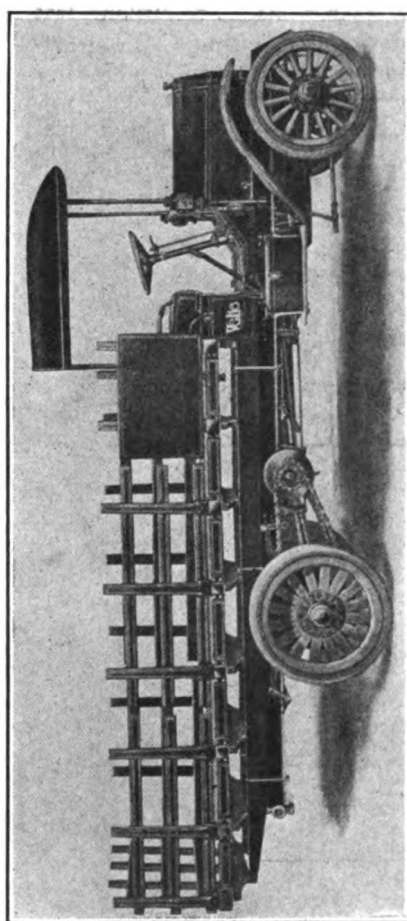
Particular attention has been given to the construction of the differential, owing to the fact that this part of a commercial vehicle is subjected to more and heavier service than the corresponding part of a pleasure car. The gears and the bearings are large and heavy and quite different in proportions from pleasure car differentials. The frame has been placed as low as possible, and is several inches lower than is usual in trucks of this size.

Atterbury Trucks—Capacity Range, 1—3 Tons.

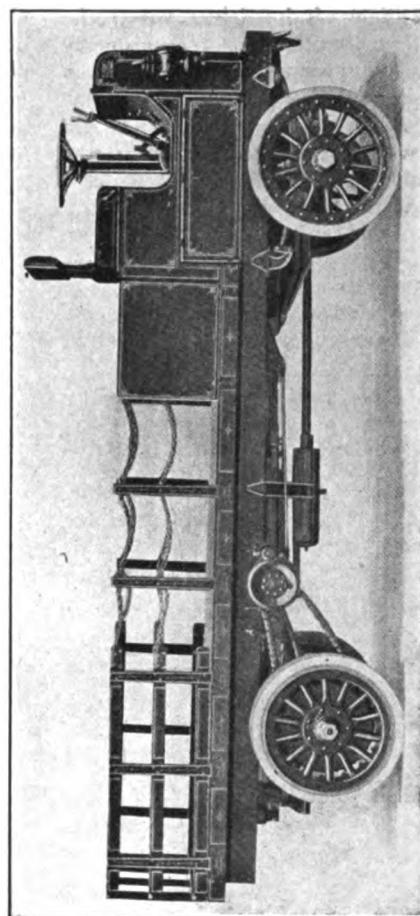
While all three of the trucks manufactured by the Atterbury company—one, two, and three tons capacity respectively—are of the same general design, the details are



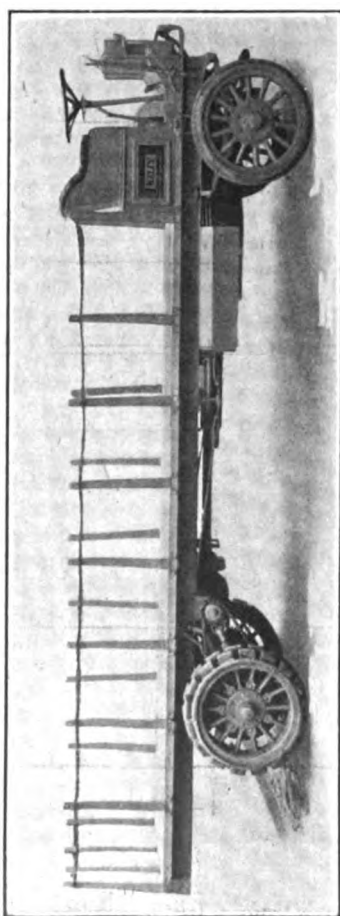
FEDERAL TRUCK WITH HIGH TYPE STAKE BODY



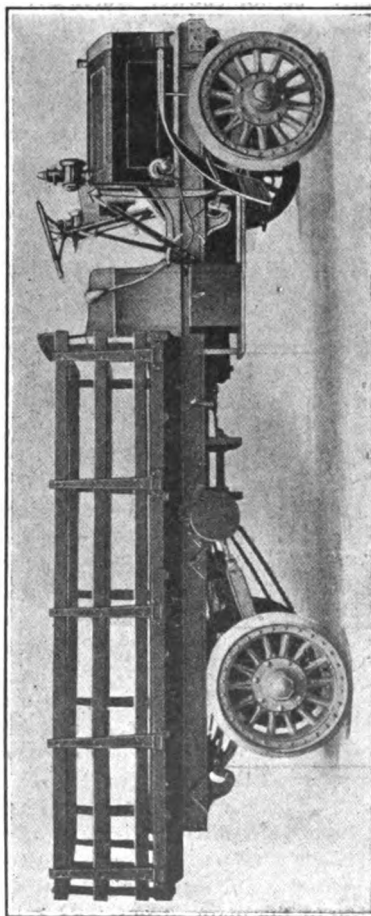
THREE-TON VELIE AS SUPPLIED WITH STAKE BODY



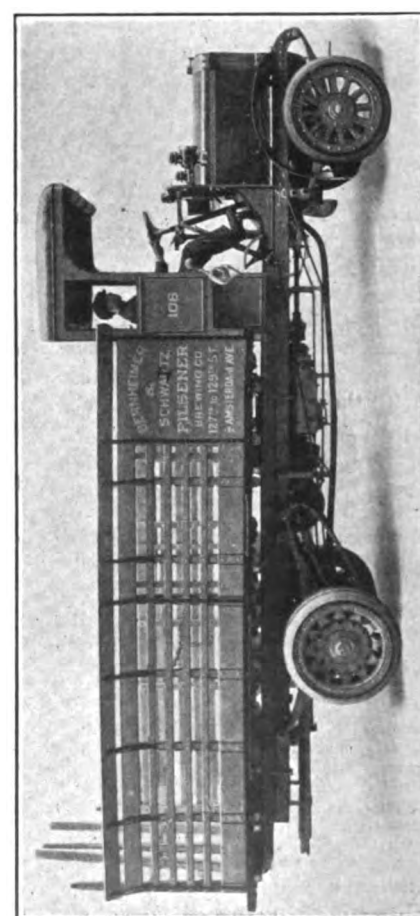
STANDARD STAKE BODY ON THREE-TON DAYTON



THREE-TON KELLY WITH EXTRA LONG BODY



TWO-TON PACKERS WITH PLATFORM TYPE OF BODY



COMMER 6 1/2-TON MODEL EQUIPPED WITH SPECIAL BODY

worked out in each size with a view to handling the load it is expected to carry. For instance, the engines for the three machines, though all of the same general type, and all equipped with self-contained lubrication systems and regulated by automatic governors, vary according to the needs of the trucks in which they are installed, the cylinder dimensions being $4 \times 4\frac{1}{2}$ inches, $4\frac{1}{4} \times 5\frac{1}{2}$ inches, and $4\frac{7}{8} \times 5\frac{1}{2}$ inches respectively. Clutches are of the multiple disk type, that in the three-ton truck being of the Hele-Shaw pattern, and the change-speed gears, operated selectively, give three forward speeds. The channel steel frames are of great strength, the three-ton truck frame being seven inches deep, to cite an example. Motors are carried forward of the dashboard.

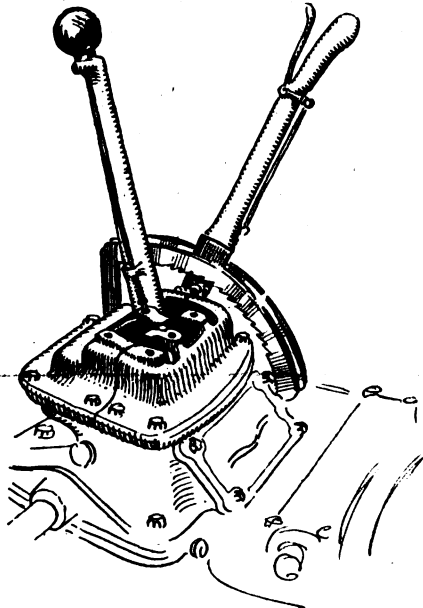
Cass Trucks—Capacity Range, 1—2 Tons; Price Range, \$1,850—\$2,650.

Built without any attempt to incorporate novel or unusual features, the Cass trucks, of one and two tons capacity, are designed to embody as far as possible only such features of commercial motor vehicle construction as are known to be satisfactory through the test of time and service. Four-cylinder motors, located forward of the dashboards, are used in both models, and in both transmission is through clutch, sliding gears and side chains. In the smaller truck, however, the motor, rated at 25-horsepower, has block-cast cylinders, the clutch is of the cone type and the gear-set provides two forward speeds, while in the two-ton machine the motor has individually cast cylinders, is rated at 29-horsepower, the clutch is a patent combination of disk and cone, and the gear-set gives four forward speeds. Springs have been given special attention because of the important bearing they have on the life of the truck, and the safety of loads of fragile goods, and they are of unusual length and flexibility, the rear semi-elliptic springs of the two-ton machine, for instance, being 62 inches long. Wheels are somewhat larger in diameter than is usual, the rear wheels of the one-ton truck being 34 inches in diameter, and those of the two-ton truck 38 inches.

Newark Trucks—Capacity Range, $\frac{1}{2}$ —2 $\frac{1}{2}$ Tons; Price Range, \$1,100—\$3,200.

Unusual without being in the least freakish, the Newark truck presents several features wherein it differs from most vehicles of its kind, though all are familiar constructional forms of known value. The general layout of the truck includes a four-cylinder block-cast motor, cone clutch, three-speed selective gear-set, and worm drive to the rear axle. There are details, however, that are of special interest, beginning at the motor and ending with the rear springs. The engine is of the enclosed type—that is, everything that can be enclosed is covered up, and no working parts are visible. The covering of the valve

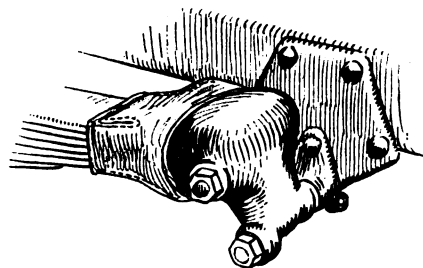
mechanism makes for quiet running, and this is still further enhanced by the use of a "silent" chain drive to the camshafts; of course the worm drive to the rear axle is a most important factor in the elimination of noise. The clutch is out of the ordinary in that it runs in oil, though of the



NEWARK GEAR SHIFT QUADRANT

leather-faced cone type. The gear-set is carried in a casing which is secured to that of the clutch, the clutch casing, in turn, being bolted to the motor crankcase, the three forming a unit. The flywheel of course is enclosed in the casing with the clutch. The speed changing lever and emergency brake lever are mounted on a bracket carried on the top of the gearcase. The gear lever is operated in a gate of the "follow-up" type—that is, the driver cannot skip, say, from first to third speed without passing through second. All gears must be engaged in turn, up or down. The worm and gear used in this car are imported from abroad.

The ends of the semi-elliptic springs are and spring joints are protected by meta-



NEWARK SPRING SHACKLE

hoods which exclude dust and retain lubricating grease. Another detail of a very practical nature is the oil circulation indicator. On the steering wheel column is a little brass cylinder from the top of which rises a small rod with a ball-shaped head. When the motor is running and the oil actively circulating, the pressure of the oil,

communicated to the little cylinder through connecting pipes, keeps the ball-ended rod pressed up, and the driver can see at a glance that his oil is moving as it should. If it is dark, he has but to put his finger on the little ball; if it is held up by the pressure all is well, but if down "on bottom" either the oil is gone or something else is wrong. Steering is done on the left-hand side of the Newark car, with the control levers in the center. Pneumatic tires are fitted as regular equipment, but solid tires are used if required by the purchaser.

Rowe Trucks — Capacity Range, 1,500 Pounds—5 Tons; Price Range, \$2,250—\$4,800.

It is the belief of the Rowe Motor Co. that it is not possible to build a stock truck, or a line of stock trucks, that will meet the requirements of all users and give the maximum satisfaction in every case, for the reason that conditions vary so widely that no one truck or line of trucks can be expected to fit every set of conditions without leaving something to be desired. Therefore this concern builds trucks only to order, and though the same general plan of construction is followed in all cases, the wheelbase, frame design, springs, road clearance, gear ratio and other details are worked out with a view to giving the best results in the particular service for which the machine is intended. Even the method of final drive is left open to the option of the purchaser or the needs of the work, either worm or chain drive being employed. There is nothing about the two trucks exhibited that is radical, either in design or construction. The motor is of the four-cylinder water-cooled type, carried under a hood in front and driving through a multiple disk clutch, three-speed selective speed-change gear and side chain or worm gear final drive, according to the governing circumstances. Motors are built in three sizes, one having cylinders measuring $5\frac{1}{8} \times 5$ inches and rated at 30-horsepower, another $4\frac{3}{4} \times 5\frac{1}{2}$, with a rating of 40-horsepower, and the third, which is a genuine long-stroke engine, has cylinders of $5\frac{1}{4} \times 7$ inches and develops 40-horsepower.

Lippard-Stewart Trucks — Capacity, All Models, 1,500 Pounds; Price Range, \$1,650—2,200.

Probably the most spectacular exhibit in the whole Palace show was the "golden chassis" of the Lippard-Stewart company—a chassis that was gilded so completely that all looked to be gold, save only the tires. Fortunately, all that glittered was not gold, but excellent steel and iron wrought into the form of a motor wagon having claims to attention far more substantial than the shine on the show chassis. The principal elements of the car are a four-cylinder motor with cylinders cast "en bloc," rated at 20-22-horsepower, a multiple disk clutch enclosed in the same housing that carries the three-speed selective slid-

ing change speed gears, and shaft and bevel gear drive to the full floating Timken rear axle. There are several features, however, that are not so often found in machines of this class. Recognizing the importance of accessibility, the builders have provided the car with a hood of the Renault type, and the radiator is placed behind the engine, so that when the hood is lifted the engine is wholly exposed and easily reached in any part. The necessity for the usual fan in front is obviated by mounting fan-blades on the periphery of the flywheel, so set as to have a suction effect. The spring suspension consists of full elliptics in front and very long semi-elliptics in the rear, the latter being supplemented by helical springs between the frame and axle, which are compressed only when the car is loaded. The leaf springs thus are free to act when the car is light, while the combined resistance of the two sets of springs ensures the holding up of the load. Having considerable respect for the incompetency of the average commercial vehicle driver, the Lippard-Stewart company has eliminated as much as possible the complications attending the gasoline motor; the cooling water is circulated without the aid of a pump, by thermo-syphon action, and ignition, by high tension magneto alone, is of the "set spark" variety, so that the driven cannot change the timing of the spark. Center control and left-hand drive complete a combination of advantageous features that are decidedly useful in a motor wagon.

Eclipse Trucks—Capacity Range, 1—1 Tons; Price Range, \$2,000—\$3,400.

Though building a line of trucks embracing no less than five different sizes, there is so little variation in design throughout the list of Eclipse machines that there is practically nothing but differences in size to differentiate between trucks of varying capacities. All have four-cylinder motors, cone clutches, three-speed Cotta gear-sets, in which the gears are always in mesh and are engaged by means of dog clutches under the control of a centrifugal governor, and side chains as a final drive.

The Eclipse company is one of a number that recognize the advantages to be gained by placing the motor under the footboards, but at the same time are not blind to the necessity for providing means for getting at the power plant for adjustments and repairs. With this end in view the entire seat framing is made removable, and when this is off the motor can be taken out in 30 minutes, only the wiring and piping requiring disconnection.

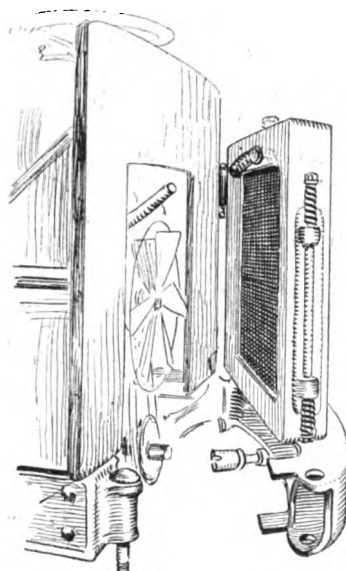
The Rutenber motor is used in the one-ton truck, the bore and stroke being $3\frac{1}{2}$ and $5\frac{1}{4}$ inches respectively, and the rating 30-horsepower. In the other models Continental motors are installed, there being two sizes, 35-horsepower with cylinders $4\frac{1}{2}$ x $5\frac{1}{4}$, and 45-horsepower with cylinders $4\frac{1}{2}$ x $5\frac{1}{2}$.

Load distribution has been the subject

of considerable thought and experimental work on the part of the builders of Eclipse trucks, and as a result the rear wheels carry 60 per cent. of the total weight, and the front wheels the remaining 40 per cent. In future this car is to be fitted with a compressed air motor starter of novel design and simple construction; a model was exhibited at the Palace, but was not shown working.

Knickerbocker Trucks—Capacity Range, $3\frac{1}{2}$ —5 Tons; Price Range, \$3,500—\$4,000.

Quick removal of the various units forming the power plant and transmission system and extreme accessibility of all parts



KNICKERBOCKER RADIATOR MOUNTING

are the features that stand out most conspicuously in the design of the Knickerbocker trucks. The radiator, to begin at the front end of the truck, is hinged and may be thrown open like a door, the front cross-member of the frame, which carries the spring mounting of the radiator, swinging out at the same time and leaving the end of the engine exposed completely. If necessary, the entire radiator may be removed, together with its suspension system, in 14 minutes. If it should be desirable to take out the motor, it can be done by removing the four bolts that secure it to the sub-frame, disconnecting the wiring and gasoline feed pipe and sliding it out, the front member of the sub-frame being deeply dropped to allow the crankcase to pass. The change-speed gear, which is a Cotta gear giving three speeds with selective control, can be removed in 21 minutes. Steering gear and jackshaft each form a unit that can be quickly removed without disturbing other parts. Final drive is by heavy side chains, the thrust being transmitted to the frame through radius rods which are provided with joints to permit movement corresponding to that of the frame with relation to the axle, and with adjustment for length.

The motor, rated at 35-40-horsepower

for the $3\frac{1}{2}$ -ton truck, and 40-50-horsepower in the five-ton machine is of the L-head type with individually cast cylinders, and is lubricated by means of the self-contained re-circulating system that is so commonly used in moors at the present time. All the crankshaft bearings, of which there are five, are carried on the upper half of the crankcase, so that the lower half can be removed and inspection made without disturbing the bearings. In all cases the motor is carried under the footboard, the provision made for accessibility of the motor making this arrangement unobjectionable.

Veerac Delivery Wagons—Capacity, All Models, 1,500 Pounds; Price Range, \$825—\$970.

Originality is displayed in equal degree in the naming of the Veerac wagon and the designing of its power plant. The name is made up of the initial letters of the words valveless, explosion every revolution, air-cooled—and the power plant is accurately described by those words. The two-cycle air-cooled motor, which has two opposed cylinders, is hung crosswise in the frame of the car and is further peculiar in that it has two separate and distinct throttles, one for each cylinder, controlled by two throttle levers on the steering wheel. This makes it possible to control the engine either by throttling both cylinders at once, or one at a time, or by cutting out one cylinder altogether and running it as a single cylinder motor. The builders believe that the best results are to be obtained by this method of control. The throttle valves are at the intake ports of the cylinders, so that throttling does not disturb the action of the carburetter. When the engine is running a strong draught of air is thrown on the cooling flanges of the cylinders by fan-blades on the periphery of the flywheel. Lubrication is effected by putting oil in the gasoline, a method that is found very satisfactory in most two-cycle motors. The necessity for a clutch is eliminated by the employment of a two-speed planetary gear, and final drive is by side chains. The Veerac car is controlled and steered from the left side. A little priming "kink" found on this car consists of a pipe leading directly from the gasoline tank to the cylinders, with a shut-off cock operated from outside the frame. By opening the cock for a moment gasoline is injected into the cylinders and starting under favorable conditions is much facilitated.

Detroit Motor Wagon—Capacity, All Models, 800 Pounds; Price Range, \$610—\$740.

The Detroit Motor Wagon, which is making its first appearance at any show, is built with the idea of obtaining simplicity in addition to the other good qualities that a small delivery wagon must possess; and to this end it is equipped with a horizontal motor of the two-cycle type, having opposed cylinders. The same idea—that of sim-

plicity—is carried out in the suspension of the motor, which has brackets cast integral with the cylinder heads, the brackets resting on and being bolted to the main frame of the car, the motor thus requiring no special sub-frame or other support. Planetary speed changing mechanism is employed, with final drive by side chains. Left-hand steering, which has gained many adherents among manufacturers of commercial cars, is used in the Detroit. A peculiarity of this machine is that the front axle is placed directly under the front end of the car, and a platform spring is used instead of the more usual springs on each side. This gives the whole frame a three-point support and eliminates "weaving" on rough roads. All kinds of bodies—open, enclosed or passenger bodies—are built on the same chassis, and at the prices quoted, the wagon looks a "good buy."

Packers Trucks—Capacity Range, 2—4 Tons.

The Packers truck makes use of the conventional arrangement of four-cylinder water-cooled motor driving through a multiple disk clutch, three-speed selective sliding gears, jackshaft and side chains to the rear wheels. The motor has its cylinders cast in pairs in the case of the two-ton truck, and has a bore and stroke of $4\frac{1}{4}$ inches and $4\frac{1}{2}$ inches respectively; the four-ton truck engine has individually cast cylinders with $5\frac{1}{4}$ -inch bore and 6-inch stroke. In both motors the cylinders are of the T-head construction. The multiple disk clutch, of the Hele-Shaw type, is carried in a casing bolted to the flywheel and is extremely neat and compact, while amply able to transmit the full power of the engine. The speed changing gearbox is bolted to, and is practically part of, the differential casing on the jackshaft housing. Service brakes are carried on the ends of the jackshaft, outside of the sprockets, the Packers company favoring this arrangement, while the emergency brakes are on the rear wheels. Very heavy radius rods take the driving stresses, and are fitted with universal joints at each end to avoid the crystallizing effects of bending stresses. The sensible and substantial construction and the standard forms used in the car indicate that the designers were familiar with the work a truck must do.

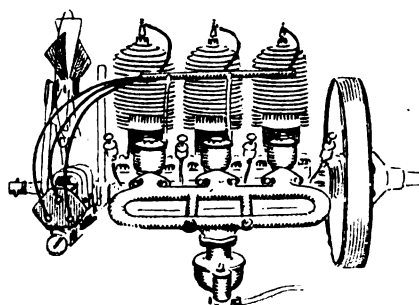
Commerce Wagons—Capacity, All Models, 1,000 Pounds; Price Range, \$700—\$850.

A powerful and compact four-cylinder motor driving through a friction speed-changing mechanism forms the characteristic feature of the Commerce light delivery wagon, which is of a convenient size for the work for which it was designed. The frame is of pressed steel, and though very light, is of ample strength for the load capacity. Cross frames support a 20-horsepower motor and the friction driving gear. Heavy steel tubing is employed in the construction of the front axle, which is dropped

at the center; the rear axle is of the live type, driven by a single chain from the jackshaft upon which the driven disk sildes.

Sanbert Delivery Wagons—Capacity, All Models, 1 Ton; Price Range, \$1,500—\$1,625.

Simplicity in the power-producing department is the keynote of the Sanford-Herbert company's wagon, which is propelled by a two-cycle motor having three air-cooled cylinders. The absence of valves and valve operating mechanism, and of radiator and water circulating system, give the front end of the machine an extremely clean, unencumbered appearance and also make the operation of the engine a matter of very little trouble. Simplicity is carried still further, for there is no special oiling system, oil in the proper proportion being



SANBERT INTAKE PIPING

put into the gasoline tank, where it mixes with the fuel and is carried to the carburetor, vaporized with the gasoline and deposited on every part of the interior of the motor that the gasoline vapor comes in contact with—and that includes every working part and every frictional surface. The engine is rated at 25-horsepower, the bore and stroke being 4 inches and $4\frac{1}{2}$ inches respectively. Ignition is by Bosch high-tension magneto.

Planetary change-speed gearing is employed, and the gear case is attached to the forward side of the jackshaft housing, which is of neat design and much resembles the rear axle housing of a shaft driven car, on a reduced scale. Final drive is by side chains to sprockets on the rear wheels, which are large—38 inches in diameter—and are fitted with $2\frac{1}{2}$ -inch solid tires. Bodies are of any type desired, but in every case the seat and footboard are over the motor and the front end is open in order to give the air free access to the motor. A belt driven fan maintains circulation while the motor runs.

Schacht Trucks—Capacity Range, 2—4 Tons; Price Range, \$2,700—\$3,200.

Though the Schacht trucks have been on the market for two years, they were exhibited at a show for the first time at the Palace. These machines are of the solid, substantial, heavy-duty type with plenty of power and transmission systems well able to transmit it to the rear wheels. In all three models built—2, 3 and 4-tons capacity—the same motor is used, having four

block-cast cylinders of $4\frac{1}{2}$ inches bore and 5 inches stroke, driving through a cone clutch and three-speed selective gear-set, shaft and bevel gears to housed jackshaft and side chains to the rear wheels. Rear axle, springs and, in fact, all details, are practically alike in type, but wheelbases are changed in different sizes, and of course the bodies are suited to the loads they are expected to carry. The motor is carried in front under a hood of the conventional type and, as is now the usual practice, the projecting ends of the side frames are joined by a cross-member which forms a "bumper" for the protection of the radiator.

Koehler Commercial Car—Capacity 1,600 Pounds; Price Range, \$750—\$825.

"Built in Newark, N. J.," is the slogan which is employed to herald the Koehler Commercial car, a popular-priced 1,600-pound vehicle built by L. E. Schlotterback Mfg. Co., and distributed through the H. J. Koehler S. G. Co., of New York City.

The motor is of the double opposed water-cooled cylinder four-cycle type, and is placed horizontally beneath the body and drives the rear wheels through the medium of a planetary transmission and chains. Extra heavy, large diameter piping, and a large radiator mounted at the front of the chassis above the frame, make for efficiency in the thermo-syphon cooling system: Ignition is by means of a Splitdorf high-tension magneto. The entire power plant is hung on forged steel hangers from the main frame, so it can be readily detached to drop.

The frame is of channel cross section and is bent "U" shape, the front protruding and forming a bumper for the protection of the radiator. It is supported on semi-elliptical springs at the front and full elliptical springs in the rear.

Four types of bodies—an open flare-board, an open flare-board with detachable top, a canvas side and a panel are supplied.

Stutz Cars—All of 40-Horsepower; Price, \$2,000.

Although never before exhibited at any show, its reputation has preceded it, and the Stutz car amply bears out the trade term which has been applied to it—the "Sturdy Stutz." Stutz parts, and the distinctive Stutz rear axle and change gear unit in particular, are well known, of course, and have come to be recognized as very nearly the last word in automobile construction. It is perhaps needless to add that Stutz cars are principally an assemblage of Stutz parts and that the whole is really a harmonious assemblage, as has been demonstrated by the performance of the car. The motor is of the T-head type with cylinders cast in pairs; the construction is out of the ordinarily inasmuch as $\frac{3}{4}$ of an inch offset is used. The dimensions of the cylinders are $4\frac{3}{4}$ inches bore and $5\frac{1}{2}$ inches stroke, and though the motor takes a nominal rat-

ing in the neighborhood of 40-horsepower on a brake test the actual power developed is approximately half as much again. The rear system is the same as has been supplied to car manufacturers throughout the country for a number of years during which time it has given universal satisfaction and scarcely has been altered from its original form. The axle and change gear housing are a unit and are of cast aluminum with generous provision made for exceptionally large bearings. Though this construction provides great rigidity the whole system is thoroughly trussed as an added precaution and to obviate the slightest possibility of the hardest kind of use altering the relationship of the component parts. The change gear mechanism provides three speeds forward and reverse, selectively obtained, and the clutch is of an improved multiple disk type in which the disks are dish-shaped to facilitate disengaging, and to make its action smooth. Although a conventional type of chassis frame is used, the arrangement of the transmission elements is such that a perfectly straight-line drive under normal conditions is obtained. In fact, this is one of the distinctive features of the car. But three body styles are supplied and these embrace a roadster, a four-passenger torpedo model and a five-passenger closed-front touring car of the conventional type. Barring a general fineness of finish, the most noteworthy feature of all the cars is their low-hung, racy appearance, which is enhanced by perfectly smooth-sided bodies of well-proportioned lines.

Best Delivery Wagons—Capacity, All Models, 800 Pounds; Price Range, \$800—\$900.

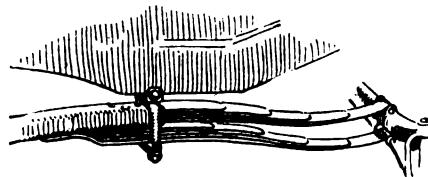
Shown for the first time, the Best car, built by the Flint Motor Wagon Department of the big Durant-Dort Carriage Co., Flint, Mich., belongs to a class that seems to be increasing in popularity with great rapidity, if the number of new and old models is any indication—the light friction drive wagon. While the Best wagon has a number of features that are common to most machines of its type, including one driving and one driven disk and side chain drive, it has a distinctive feature in the yoke-shaped steel frame that carries the disks and their shifting mechanism. Secured under the main frame of the car, this yoke has its opening to the rear; the countershaft, upon which the sliding disk is mounted, runs in ball bearings carried at the ends of the yoke arms and the driving disk is journaled in ball bearings in the apex of the yoke. The object of this construction is to give rigidity to this important part of the mechanism and prevent disalignment under heavy stresses. The motor, which is of the opposed cylinder type, rated at 12-horsepower, is regulated as to speed by a centrifugal governor, which also automatically advances the spark when the speed of the engine re-

quires it, and ensures a fully retarded spark for starting. The governor holds the maximum speed of the wagon to 18 miles an hour.

Brooks Light Delivery Wagon—Capacity, 750 Pounds; Price, \$550.

Although to the casual observer, the Brooks wagon, a new Michigan product staged by the New York Auto Wagon Co., appears not unlike the general vehicles, closer inspection reveals several radical features.

The motor in itself is interesting, being a two-cylinder two-cycle air-cooled type, horizontally placed, but instead of having cooling flanges cast integral with the cylinder as is the usual custom, they are built up of sheet copper vanes. The engine is supported by means of shackles, transversally across the frame with the crankshaft parallel with the rear axle the



BROOKS FRONT SPRINGS

distance between centers being varied by shifting the motor forward or backward, to obtain the different speed ratios, the shackle supports permitting of free movement. Lubrication is accomplished by mixing the oil with the fuel, as is usual with two-cycle motors. A Bosch high-tension magneto supplies the ignition.

What scarcely may be termed a friction transmission, but which still partakes of many of the features of one, is used on the Brooks wagon. It is the roller device invented by Charles E. Duryea, by the use of which a great many otherwise necessary parts are eliminated. The driving rollers, which are grooved and fit correspondingly grooved rings bolted to the drive wheels, are attached to the crankshaft of the engine. There are two pairs of driving rollers, a small pair for slow speed ahead and reverse, and a larger pair for high speed. Similarly, there are two pairs of grooved rings arranged concentrically with the grooves facing. Bringing the small rollers in contact with the outside rings, by shifting the engine with the speed control lever, slow speed ahead is obtained. When the small rollers are shifted back and come in external contact with the inside rings, the reverse drive is obtained. Shifting the rollers inward and forward brings the larger pair into internal contact with the outside rings and gives high speed ahead. The shifting devices are simple and positive, being actuated by a single lever in front of the driver. The driving rollers themselves are of hardened steel.

A platform spring on the rear supports the wood sill frame onto which the body

is placed. The sills are attached by means of a pivot bracket directly to the frame at the front of the car, the pivot block permitting the necessary freedom of movement to allow for the play of the rear spring. The front springs, which are quarter elliptic in form, and double on either side, one being superimposed upon the other, are bolted directly to the pressed steel channel frame, the front ends being rigidly attached to the axle.

Poss Delivery Wagons—Capacity, All Models, 1,000 Pounds; Price Range, \$850—\$1,000.

Unusually high power in proportion to weight and carrying capacity is one of the chief characteristics of the Poss half-ton friction driven wagon. The motor is of the four-cylinder variety with cylinders cast "en bloc" and has a long stroke— $3\frac{1}{2} \times 4\frac{3}{4}$ inches, bore and stroke, respectively, designed to run at moderate speed. The entire chassis is exceedingly simple and the two-disk clutch contributes in no small degree to the lack of complication. The engine is hung on brackets or arms bolted directly on the main frames, the driving disk is carried in bearings in a cross frame and the shaft of the sliding driven disk is supported on the main frame, so that all sub-frames are dispensed with. Final drive is by single chain to the live rear axle, which runs on Hyatt high-duty roller bearings. As the weight of wagon is but 1,500 pounds, it is fitted with pneumatic tires if desired, at an advance in price over solid tire equipment.

Dart Delivery Wagon—Capacity, All Models, 1,000 Pounds; Price Range, \$650—\$690.

The Dart is a wagon that does not rely upon any one or two particular features for its claims to notice, but is built throughout on substantial lines and on well-known and well-tried principles. The motor, of 16-20 horsepower, has two opposed cylinders, water-cooled, and is set with its shaft crosswise of the car, driving through a planetary change speed gear carried on an extension of the crankshaft. A single chain drives to a jackshaft, journaled on the main frames and carrying the differential, and final drive is by side chains. The high speed clutch is of the multiple disk type and is engaged by means of a hand lever, low speed and reverse being operated by pedals. Wheels are 34 inches in diameter and are fitted with $1\frac{3}{4}$ -inch solid tires.

Sullivan Delivery Wagon—Capacity Range, 1,000—1,500 Pounds; Price Range, \$925—\$1,050.

Though built in two sizes, carrying 1,000 and 1,500 pounds respectively, the Sullivan wagons are alike as regards power plant, transmission frame, wheels, springs and bracing—and of course, bodies—being roomier and heavier in the larger size. The power plant and transmission system in-

clude a two-cylinder opposed motor of 18 horsepower suspended by cylinder-head brackets from the side frames, planetary change speed gear with cone clutch that is readily adjustable, universal-jointed shaft to differential or jackshaft, and side chains to sprockets on the rear wheels. The motor is oiled by force feed lubricators mechanically operated, and is cooled by the thermosiphon system. Ignition is by Bosch high-tension magneto, the magneto being mounted on the crankcase. A very marked tendency of the trade is followed in placing the steering wheel on the left-hand side of the car. For the sake of accessibility, the motor is placed in front of the dashboard under a hood. Solid tires, 36 x 2½ inches, are standard equipment.

Modern Delivery Wagons—Capacity Range 1,000—1,500 Pounds; Price Range, \$1,200—\$1,600.

While the Modern is a member of the light delivery class, it is built on sturdy lines and has much the appearance of a big truck on a small scale—a look of strength. The four-cylinder motor, of 25-horsepower for the 1,000-pound wagon and 30-horsepower for the 1,500-pound machine, are of the block-cast type with all valve mechanism enclosed, driving through cone clutch, three-speed selective sliding gears, jackshaft and side chains to the rear wheels. The engine is carried forward under a hood and is water-cooled by forced circulation and lubricated by a circulating system which includes a positively driven plunger pump and a sight feed on the dashboard, in plain sight of the driver. The car being of light weight, pneumatic tires are fitted as standard equipment, but solids will be applied if the purchaser so desires. Any type of body can be fitted, these usually being made to order to suit the requirements of the service for which the machine is intended.

Maxim Delivery Tricar — Capacity, 600 Pounds; Price, \$395.

The tricar or three-wheeler simply will not "down." No matter how many setbacks this type of machine may receive, it reappears in some other form, serene and confident. The latest arrival in the "triangular" class is the Maxim tricar which, however, is not wholly new as under another name it appeared at the 1911 show in the old Grand Central Palace. It then was shown by the Germans who are responsible for it, but it now comes from Morgantown, W. Va. Speaking generally, the Maxim is of the class having the single wheel in front and the power plant and transmission system mounted over the front wheel, there being no mechanism whatever attached to the body or rear axle—unless the brakes can be said to come under this head. Final drive is by chain to a large sprocket on the front wheel, on the left side. It is an astonishing-appearing contrivance, and is worthy of extended mention at this time only because of a

radical and amazing development in the form of a device which takes the place of the usual gears for speed changing. Broadly speaking, it is of the hydraulic type, and its general appearance is that of a short cylinder somewhat smaller than the crankcase of the engine, carried on an extension of the crankshaft. The sprocket for the driving chain is mounted on a sleeve, between the crankcase and the speed changing device, and integral with the latter, and the whole arrangement has much the appearance of a planetary gearcase. It is far from that, however, being filled with oil. The action of the apparatus is as follows: When no power is to be transmitted, the vanes on the shaft disk are folded, and if the motor then is started the disk and its vanes will churn around idly in the oil. If, however, the handle is turned so as to open the vanes, they start the oil circulating in the casing; it is thrown violently from the pockets formed by the movable vanes into those formed by the fixed vanes, and imparts to the latter, and of course to the casing, the sleeve and the attached sprocket, chain and the front wheel of the car, a rotary motion. If the movable vanes are raised further, there is a more violent movement of the oil, which is thrown with greater force and in greater volume into the fixed vanes, and more power is transmitted, until, on full opening, when there is just room for the vanes to clear each other, the shaft disk and the sprocket-carrying casing rotate almost together, there being a very small amount of slip or lost motion.

The motor is of the two-cylinder, air-cooled type, with its shaft crosswise. A striking feature is a pair of hollow ribbed columns containing water for the cooling of the exhaust valves.

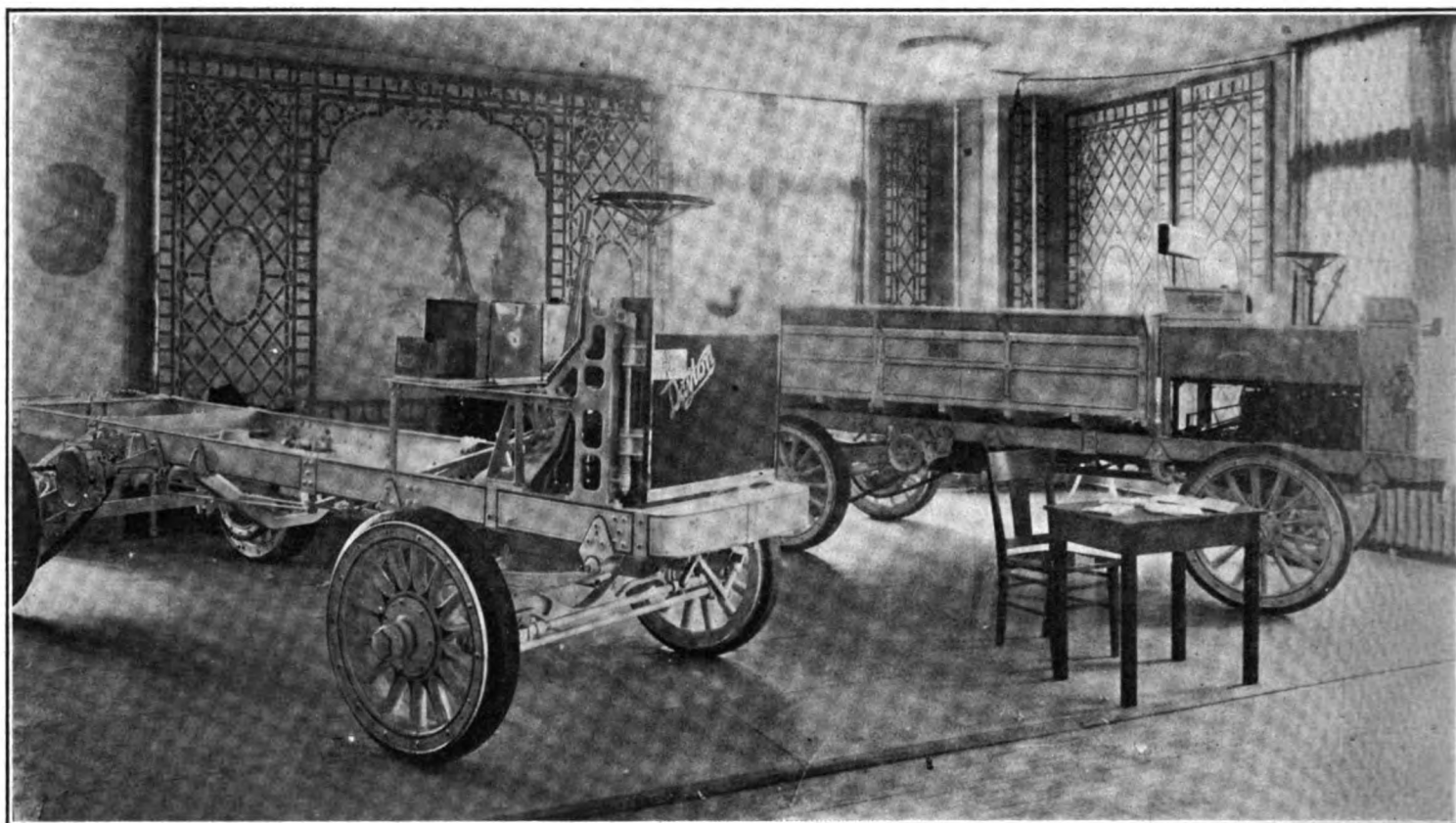
Stuyvesant Cars—All of 50 Horsepower; Price, \$4,200.

The Stuyvesant is another car which almost literally radiates substantiality and individuality. It has been styled "the car of precision" by its manufacturers, and there are few cars which more aptly fit the various trade slogans that have been conferred upon them. The car is new in the sense that it makes its first public appearance at a really big show, though those who have good memories will have little difficulty in remembering the once famous Gaeth car from which the Stuyvesant is a direct outgrowth. Those who do remember the Gaeth car, however, would have considerable difficulty in recognizing it in the redesigned and very much amplified Stuyvesant, for practically the only Gaeth feature which is retained is the motor, though this too has undergone a general revision, and is even more efficient and reliable than when it made a name for itself in Gaeth cars. It is of the T-head type with cylinders measuring 4¾ inches bore and 6 inches stroke; the cylinders are cast in pairs and provision has been made for

exceptionally large bearing surfaces. An engine starting and electric lighting system has been added, and it is absolutely unique in principle in that it embraces a motor and a generator which are separate and distinct units. The motor is used only to start the engine, and is mounted in the chassis frame and connected to the engine by means of spur gearing cut directly on the periphery of the flywheel. The gears on the motor starter and the flywheel are enmeshed by means of a pedal located between the brake and clutch pedals, and are thrown out of mesh automatically when the engine starts. The generator by means of which the storage battery automatically is maintained fully charged is driven from the pump shaft through the intermediary of a chain of the "silent" type. A single seven-passenger touring car is exhibited and in common with all the cars in the line features left-hand position of the steering wheel, with the gear shift and emergency brake levers in the center of the footboard. The body itself is a pretty piece of work, roomy and luxurious, and is one of the best appointed creations at the show. Lines are well proportioned and a general straight-line effect is obtained by high doors and engine hood, and a low lying top. The equipment of the car is most complete and in addition to the usual items includes such others as slip covers, combination Klaxon horn, combination speedometer and clock, and a four-cylinder tire inflating pump, engine driven, to say nothing of the engine-starter, and the electric lighting system.

Walker Trucks—Capacity Range, 750—7,000 Pounds; Price Range,

Internal drive, with all gearing enclosed in the disk rear wheels, a single electric motor with its shaft extending across from wheel to wheel, each end of the motor shaft driving a wheel, and a differential in the motor shaft, are the striking features of the Walker balance drive electric vehicles. The electric motor is enclosed in the hollow casing which forms the rear axle and carries the wheels on its ends, and the motor shaft extends through the ends of the casing into the wheels. On each end of the shaft is a small spur pinion which meshes with two large gears, the gears, in turn, meshing, at diametrically opposite points, with a large internal gear secured to the inside of the wheel rim. The two intermediate gears turn on studs on opposite ends of a yoke which is itself mounted on the end of the hollow axle casing which projects into the wheel. The advantageous features of this arrangement are that the torque of the motor shaft is exerted at two opposite points and the forces are balanced, being opposite and equal; bearings are relieved of side thrust and all stresses are purely torque or turning stresses. The outer of the two concave disks which form the wheel and enclose the gears is easily removable when



DAYTON TRUCK DISPLAY; ALSO SHOWING LATTICE AND WOODLAND DECORATIVE SCHEME

the bolts securing it to the rim are taken out, and the inspection of the gearing is easy. A considerable quantity of lubricant is placed in the wheel, and the gears thus are always well oiled. Dust and dirt are excluded and the gears work under very favorable conditions. The wheels run on Hess-Bright ball bearings.

Owing to the peculiar construction of the hollow rear axle, the motor is extremely accessible. The upper part of the casing is removable when six cap-screws are taken out, and the whole of the motor, together with the differential on the shaft, can be examined. One of the field magnets, with its winding, and one of the brushholders, are attached to the removable cover, the wire cable connections being sufficiently slack to permit the cover to be

removed without disconnecting anything. Batteries in the Walker cars are carried forward, in the usual way, but owing to the small space required for the motor there is an unusual amount of room for this purpose.

Argo Electric Delivery Wagons—Capacity Range, 1,000—2,000 Pounds; Price Range, \$1,800—\$2,200.

One of the few electrically propelled commercial vehicles at the Grand Central Palace show, the Argo wagon was noticeable because of the neat and practical manner in which the motor and transmitting mechanism are combined in a unit. The motor, of the Westinghouse ironclad type, has its housing rigidly connected with that of the live rear axle by a tubular cas-

ing, and drive is through a short shaft and herringbone gears. The forward end of the motor is supported from the framing. The controller and brakes of the Argo are so interlocked that it is not possible for the driver to apply the brakes while the power is on; and, on the other hand, it is impossible to turn on the current and start the motor without first releasing the brakes. The steering wheel, on a vertical column, is placed on the left side of the car, and the controller handle is on the column, under the wheel, where it is easily reached. The Argo cars have a rated mileage of 45 and 50 miles on a single battery charge, for the smaller and the larger model respectively, loaded one way. The average speed is 12 miles an hour under ordinary conditions.

Summary of Commercial Vehicles Staged in Grand Central Palace

Gasolene Trucks.

Atterbury Motor Car Co., Buffalo, N. Y.—Three four-cylinder Atterbury gasolene trucks. One each three-ton, two-ton and one-ton vehicles.
Bowling Green Motor Car Co., Bowling Green, Ohio—Two four-cylinder Modern gasolene trucks. One each 1,000-pound and 1,500-pound delivery wagons, and one 1,500-pound chassis.
Bushnell Press Co., G. H., Thompsonville, Conn.—One two-cylinder gasolene Maxim Tricar.
Cass Motor Car Co., Port Huron, Mich.—

One four-cylinder gasolene Cass truck of two tons capacity.
Chase Motor Car Co., Syracuse, N. Y.—Five three-cylinder two-cycle, air-cooled gasolene trucks. One each 1,500-pound delivery wagon, one-ton open stake truck, one-ton express truck, one-and-one-half-ton delivery car, two-ton truck and one-ton chassis.
Commerce Motor Car Co., Detroit, Mich.—One each one-half-ton friction driven delivery wagon and chassis.
Dayton Auto Truck Co., Dayton, Ohio—One four-cylinder, two-ton gasolene

truck, and one four-cylinder three-ton chassis.
Decatur Motor Car Co., Decatur, Ind.—One each four-cylinder one-and-one-half-ton truck and chassis.
Durant-Dort Carriage Co., Flint, Mich.—One two-cylinder double opposed, friction-driven gasolene delivery wagon, one 800-pound chassis and one panel body.
Eclipse Truck Co., Franklin Pa.—Three four-cylinder, Eclipse gasolene trucks. One each one-ton, three-ton and four-ton trucks and one chassis.
Federal Motor Truck Co., Detroit, Mich.—

Two one-ton Federal gasoline trucks and one one-ton chassis.

Dart Mfg. Co., Waterloo, Ia.—One two-cylinder double opposed, 1,500-pound Dart delivery car and one chassis.

Gramm Motor Truck Co., Lima, Ohio—Four four-cylinder Gramm gasoline trucks. One each one-ton, two-ton, three-ton and five-ton trucks, and one three-ton chassis.

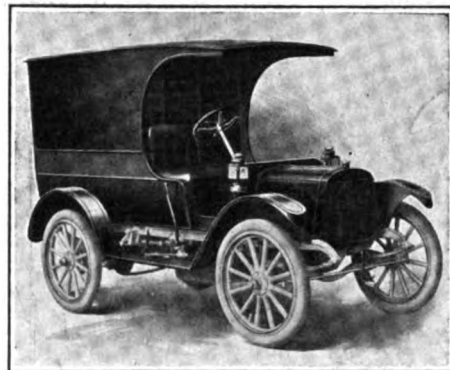
Jaccard & Co., J. & Co., New York—One four-cylinder, steel-shod Aries seven-ton truck and one seven-ton chassis.

Kelly Motor Truck Co., Lima, Ohio—Three four-cylinder, air-cooled Kelly trucks, one each one-and-one-half-ton truck, two-ton truck, 14-passenger hotel bus and one-and-one-half-ton chassis.

Lippard-Stewart Motor Car Co., Buffalo, N. Y.—Two 1,500-pound Lippard-Stew-

cylinder, friction driven Poss gasoline truck of one-half-ton capacity, and one chassis.

Sanford-Herbert Co., Syracuse, N. Y.—Two three-cylinder, air-cooled, two-cycle San-



POSS LIGHT DELIVERY CAR

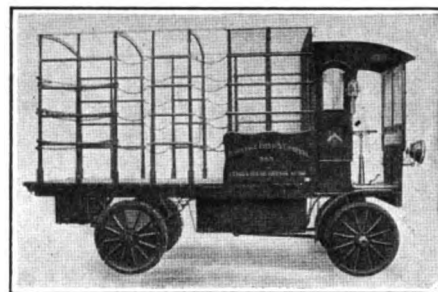
bert trucks of one-ton capacity, and one one-ton chassis.

Schacht Motor Car Co., Cincinnati, Ohio—One four-cylinder, three-ton Schacht gasoline truck.

Sullivan Motor Car Co., Rochester, N. Y.—Two two-cylinder, double opposed, one-half-ton Sullivan delivery cars.

Schlotterback, L. E., Mfg. Co., East Orange, N. J.—One two-cylinder, double-opposed, 1,500-pound Koehler delivery wagon and two panel bodies.

Universal Motor Truck Co., Detroit, Mich.—Two three-ton gasoline trucks and one three-ton chassis.



WALKER ELECTRIC TRUCK

Veerac Sales Co., Paterson, N. J.—One two-cylinder, two-cycle, air-cooled delivery wagon of 1,500 pounds capacity, and one 1,500-pound chassis.

Lauth-Juergens Motor Car Co., Fremont, Ohio—One three-ton, four-cylinder gasoline truck and one one-ton delivery van.

Walter Motor Truck Co., New York—One three-ton, four-cylinder gasoline furniture wagon, one three-ton chassis and one five-ton chassis.

Velie Motor Vehicle Co., Moline, Ill.—One three-ton, four-cylinder Velie truck, one three-ton chassis and one 1,500-pound delivery wagon.

Victor Motor Truck Co., Buffalo, N. Y.—One two-ton, four-cylinder Victor gasoline truck.

Rowe Motor Co., Coatesville, Pa.—One one-and-one-half-ton four-cylinder, gasoline truck, one 1,500-pound delivery wagon.

Wyckoff, Church & Partridge, Inc. New



THE "BEST" MOTOR WAGON

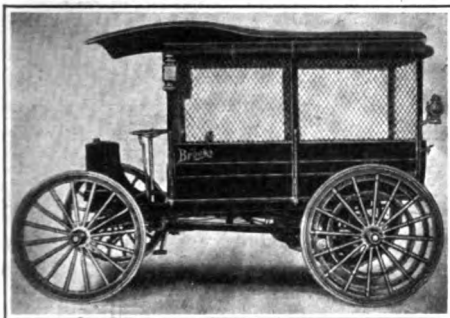
York—Two four-cylinder gasoline Commercial trucks; one each six-and-one-half, and four-and-one-half-tons, one four-and-one-half-ton chassis.

Electric Trucks.

Argo Electric Vehicle Co., Saginaw, Mich.—Two Argo electric vehicles. One each and four-and-one-half-tons, and one four-and-one-half-ton chassis.

Hupp Corporation, Detroit, Mich.—One 1,000-pound Hupp-Yeats electric delivery wagon.

Walker Vehicle Co., Chicago, Ill.—Two Walker electric delivery wagons. One each of one-half-ton and one-and-one-half-ton capacity, and one one-half-ton chassis.



BROOKS DELIVERY WAGON

art delivery wagons and one 1,500-pound gilt chassis.

Motor Wagon Co., of Detroit, Mich.—Five two-cylinder, double opposed Detroit gasoline cars. Four 800-pound delivery vans, one eight-passenger carry-all and one 800-pound chassis.

Newark Auto Mfg. Co., Newark, N. J.—One four-cylinder Newark gasoline truck of one-ton capacity and two one-and-one-half-ton chassis.

New York Auto Wagon Co., Brooklyn, N. Y.—One two-cylinder, two-cycle, air-cooled Brooks delivery car of 800 pounds capacity.

Packers Motor Truck Co., Wheeling, W. Va.—One two-ton Packers truck and one two-ton chassis.

Poss Motor Co., Detroit, Mich.—One four-

Several New Accessories Crop Out in Grand Central Palace Show

Contrary to expectations, based on the number seen at the Garden show, the accessory department yielded but one new engine starter. Three were in evidence, but the Thompson and the Perkins, both of acetylene type, made by the A. C. Thompson Automobile Co., Plainfield, N. J., and the William M. Stacy Mfg. Co., of Springfield, Mass., respectively, were shown at the Garden. The Auto-Starter, a product of the Volkmar Auto-Starter Co., New York City, was the new comer. It is of

the spring actuated type, designed to be attached on the end of the shaft from which the crank is removed. By pressing a supplementary foot pedal the energy stored in the two powerful springs is released and turns the motor over several times at high velocity. The springs which are enclosed in a steel case, are rewound and the whole apparatus automatically released from the shaft by the motor.

One new demountable rim made its appearance—the Invincible, made by the In-

vincible Demountable Rim Co., of Jersey City, N. J. It is provided with short, heavy dowel pins which slide with ease into tapered "L" shaped keyways cut into the felloe of the wheel. The rim is attached by giving it first a push to force the pins in as far as the turn in the keyway, then a slight turn to the right in which position it is held by a vanadium steel locking trigger. To release the rim it is only necessary to press the trigger and repeat the operation in the reverse order.

Spring wheels—two of them cropped-up—the Peck in the design of which the makers, the Peck Wheel Co., of Chicago, Ill., utilize the compressibility of helical springs held in cylinders which form the spokes; and the product of the Sewell Cushion Wheel Co., of Detroit, in which the desired effect is attained by means of rubber rolls placed between the two halves of a split felloe wheel.

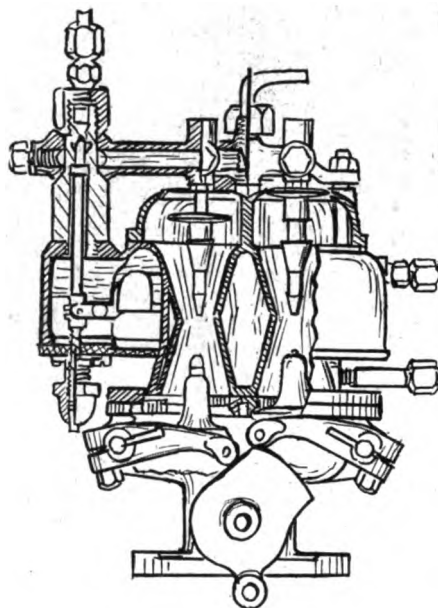
Three different types of speedometers were exhibited by as many manufacturers, the tried and proven Warner magnetic, the equally well-known Veeder liquid tachometer, both of which were exhibited at the Garden show, and a centrifugal type shown by the Brown Speedometer Co., of New York City.

Radical in a large sense is the Fitzall wrench introduced by the Standard Wrench & Tool Co., of Providence, R. I., the name of which explains its purpose. The wrench is made up of but three movable parts—the main handle bar, the wedge shaped lower jaw, and the sliding collar or yoke which serves to lock them together. The lower jaw is tapered, and on being forced into the collar by the operation of turning the nut, locks itself to the handle bar. The slight movement necessary to lock the wrench provides just sufficient space between the two jaws to allow of the easy removal to secure a new bite. In the design of the pipe wrench, teeth on the lower jaw are discarded, and those on the upper jaw are made easily replaceable by virtue of their being formed on a separate plate attached to the forging by a tenon joint, locked with a pin. The wrenches are drop forged from selected steel.

But four makes of carburetters were on view—the well-known Stromberg, the Schebler, the G & A and the C. R. G., the last of which is shown by the C. R. G. Mfg. Co., Saugus, Mass., and is novel in that the control of the gasoline at high speeds is by means of non-adjustable nozzles, the openings of which are proportioned to the bore and stroke of the motor.

The carburetter operates on the well-known venturi tube, multiple jet principle, but differs from other devices of the same type, the three jets being placed in as many tubes which are assembled in one casing which with the float chamber placed around the outside, forms the body of the carburetter. The jets are placed concentric with regard to their respective tubes, the jet which supplies the gasoline at low speeds, being adjustable by means of a needle valve, the others are supplied with jets drilled with holes determined by the bore and stroke of the engine. At the top and bottom of each tube is placed a poppet valve held on its seat by gravity, those at the bottom as well as the upper one on the low speed tube being free to open at all times, the upper valves on the intermediate and high speed tubes however, are held on their respective seats by stops controlled by a cam mounted on and operating with the butterfly throttle valve stem.

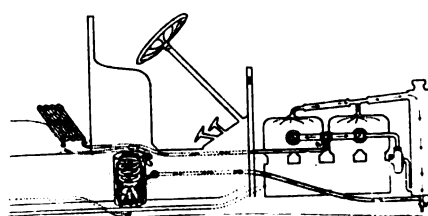
As the throttle is opened and the motor speed reaches a point where the low speed tube is unable to supply sufficient quantity of mixture the cam releases the intermediate valve and the high speed valve in the order named. Dashboard control is unnecessary,



C. R. G. CARBURETTER IN SECTION

since the purpose of the lower poppet valves is to supply a rich mixture for starting, which they accomplish by retarding the flow of air into the tubes, until there is enough pressure to lift them off their seats. The partial vacuum thus draws an excessive amount of fuel through the jets, which on being mixed with the small quantity of air supplied, due to the low piston speed, forms a good rich mixture.

The prevention of freezing of the water in the jackets or radiator, and the maintenance of a uniform temperature within



APPLICATION OF JAMES "THERMOS"

an enclosed car, constitute, with a number of lesser items, the claims made by the James Thermos Co., of New York City for their system of heating, which was displayed for the first time. The apparatus is nothing more or less than a coil of copper tubing arranged in an asbestos lined brass case placed on the dashboard similar to an acetylene generator, so that it is heated by the flame from a gasoline burner. In attaching the apparatus to perform the duties mentioned in claim 1, it is simply necessary to connect, by means of flexible water tubing, the top of the coil to the lower water manifold, and the lower end of the coil to the lowest available point of the radiator. The burner is supplied from

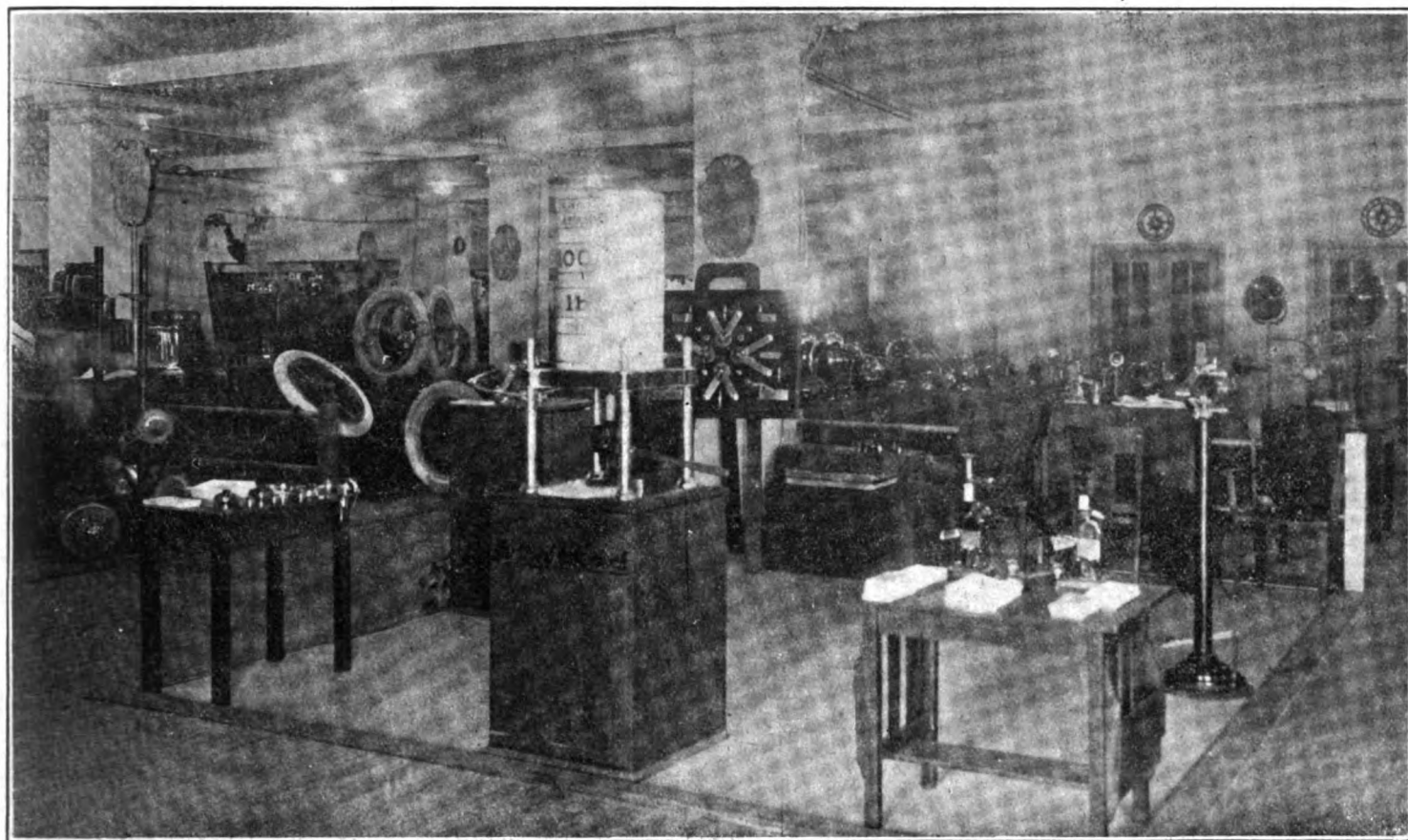
a pressure tank conveniently located. A thermo-syphonic action is set up in the coil, and the warm water heats the motor and radiator to any desired temperature, and maintains that temperature. By attaching a coil radiator in the system, a foot warmer, for open-car use, or a heater in the case of a coupe or limousine, add to the comforts of the motor car user.

There is one other novelty—the Aeron—a paint-spraying device made by the DeVilbiss Mfg. Co., of Toledo. The paint is sprayed through an adjustable atomizing nozzle in either a coarse or a fine stream, depending upon the class of work and quality of paint. The perfectly smooth coat obtained by reason of the absence of brush marks, which need not be sandpapered down before the application of the succeeding coats, is claimed to result in decided shrinkage of the labor bill.

The only ignition apparatus not exhibited at the "other show" were the S. & D. dynamo with automatic control, displayed by the Spindler & Deringer Mfg. Co., of Jersey City, N. J., "Essex" storage batteries, exploited by J. H. Faw, of New York City, and two new spark plugs exhibited by, respectively, the Mac-Kae Mfg. Co., of Boston, Mass., which displayed the Mac-Kae plug, which is of conventional pattern, and the G. C. Blickensdorfer Mfg. Co., of Stamford, Conn., which produces the Bull's Eye spark plug, distinguished by an internal spark gap arranged in a tiny "window," permitting the spark to be seen.

The following is the summary of accessory exhibitors:

- Automatic Motor & Mfg. Co., Chicago.
- Ill.—Church pneumatic transmission system.
- Automobile Journal Publishing Co., Pawtucket, R. I.—Publications.
- Blickensdorfer Co., G. C., Stamford, Conn.—Bull's-Eye spark plugs.
- Booth Demountable Rim Co., Cleveland, Ohio—Booth demountable rims.
- Brown Speedometer Co., New York City—Brown speedometers.
- Chilton Co., Philadelphia, Pa. — Publications.
- Class Journal Publishing Co., New York City—Publications.
- Cox Brass Co., New York City—Windshields and air gauges.
- Cramp & Son Ship and Engine Bldg. Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.
- C. R. G. Mfg. Co., Saugus, Mass.—C. R. G. carburetters.
- Crowell Chemical Co., New York City—Oxford polishes.
- Dean Electric Co., Elyria, Ohio—Tuto horns and Dynalux lighting systems.
- Deflector Shield Co., Brooklyn, N. Y.—Windshields.
- DeVilbiss Mfg. Co., Toledo, Ohio—Aeron paint spraying apparatus.
- Diamond Rubber Co., Akron, Ohio—Diamond tires.



HOW ACCESSORIES WERE DISPLAYED ON THE THIRD FLOOR TRUFFAULT-HARTFORD EXHIBIT IN FOREGROUND

- Dyneto Electric Co., Syracuse, N. Y.—Ignition and lighting apparatus.
- Edison Storage Battery Co., West Orange, N. J.—Storage batteries.
- Empire Tire Co., Trenton, N. J.—Empire tires.
- Faw, J. H., New York City—Electrobola lamps, Essex ignition specialties, Walden wrenches, etc.
- Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires and rims.
- Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.
- Four Wheel Auto Jack Mfg. Co., Reading, Pa.—Four wheel automobile jacks.
- G & A Carburetter Co., New York City—G & A carburetters.
- Gemmer Mfg. Co., Detroit, Mich.—Steering gears and parts.
- Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
- Goodyear Tire and Rubber Co., Akron, Ohio—Goodyear tires.
- Gray & Davis, Amesbury, Mass.—Lamps and lighting dynamos.
- Hartford-Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers and Hartford jacks.
- Hercules Waterproofing Co., New York City—Waterproof fabrics and rain coats.
- Horseless Age, New York City—Publications.
- Howard Demountable Rim Co., New York City—Howard demountable rims.
- Import-Export Mfg. Co., New York City—Simplex tires, Regent combined punch, shear and rod cutter.
- Invincible Demountable Rim Co., Jersey City, N. J.—Invincible demountable rims.
- James Thermos Co., New York City—Thermos heaters.
- Lavigne Mfg. Co., Detroit, Mich.—Steering gears and lubricators.
- Mac-Kae Mfg. Co., Boston, Mass.—Mac-Kae spark plugs and Jericho specialties.
- McCue Co., Buffalo, N. Y.—Axles.
- Metal Stamping Co., Long Island City, N. Y.—Bronze castings.
- Miller, Charles E., New York City—Pan-American oils and greases; Brampton chairs and general supplies.
- Motz Clincher Tire and Rubber Co., Akron, Ohio—Motz cushion tires.
- Motor World Co., New York City—The Motor World.
- Muncie Gear Works, Muncie, Ind.—Transmissions and gears.
- National Carbon Co., Cleveland, Ohio—Dry cells.
- Pacific Coast Borax Co., New York City—Grime-Off hand cleanser.
- Peck-Wheel Co., Chicago, Ill.—Resilient wheels.
- Pennsylvania Rubber Co., Jeanette, Pa.—Pennsylvania vacuum cup pneumatic tires and Polack solid tires.
- R. I. V. Co., New York City—R. I. V. ball bearings.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting apparatus.
- Ross Gear & Tool Co., Lafayette, Ind.—Steering gears.
- S. K. F. Ball Bearing Co., New York City—S. K. F. ball bearings.
- Sewell Cushion Wheel Co., Detroit, Mich.—Spring wheels.
- Shore Instrument Mfg. Co., New York City—Testing instruments.
- Spindler & Deringer, Jersey City, N. J.—Electric lighting system.
- Standard Wrench & Tool Co., Providence, R. I.—Standard wrenches and tools.
- Stromberg Motor Devices Co., New York City—Stromberg carburetters.
- Swinehart Rubber & Tire Co., Akron, Ohio—Tires.
- Thompson Automobile Co., A. C., Plainfield, N. J.—Thompson engine-starter.
- Timken-Detroit Axles Co., Detroit, Mich.—Axles and transmissions.
- Townsend & Co., S. P., Orange, N. J.—Townsend grease gun.
- United States Tire Co., New York—Hartford, G. & J., Morgan & Wright, Continental and United States tires.
- Veeder Mfg. Co., Hartford, Conn.—Veeder speedometers and odometers.
- Volkmar Automobile Starter Co., New York City—Engine starters.
- Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.—Tanks and pumps.
- Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.
- Warner Instrument Co., Beloit, Wis.—Warner autometers and odometers.



GENERAL VIEW OF MADISON SQUARE GARDEN ARENA SHOWING ITS CHANGED APPEARANCE WITH TRUCK EXHIBITS IN PLACE



The Trucks Displayed in Madison Square Garden

They Comprise Most Impressive Collection Ever Staged in this Country and Illustrate Truck's Varied Employment—Development of Bodies for Specific Uses Shown to be Keeping Pace with Mechanical Improvement.

Business before pleasure may be the usual order, but when the Automobile Board of Trade places pleasure before business, in the words of the grape-nut man, "there's a reason." It pays to do so, and it is the better part of wisdom. Which is to say that from the general standpoint there is more business in pleasure cars than in commercial vehicles. It is not strange, therefore, that Part One of the Madison Square Garden show should be made up of pleasure cars, and Part Two, the second week, be given up to trucks and such like.

The change took place between 11 o'clock Saturday night and 8 o'clock Monday evening. The remarkable attendance which, despite unfavorable weather, characterized the first week, continued to the very end. If the box office count does not show that all attendance records were broken, then appearances are indeed deceitful. The great building was thronged early and late.

Before the last spectators departed Saturday evening, the hegira of the pleasure car already had commenced. It is a mighty task to move out 60 exhibits of cars, and more than 150 exhibits of sundries, and to move in 32 exhibits of trucks, many of them ponderous structures; it required much agility, some muscle and considerable intelligence to perform the great shift. While 153 exhibitors of sundries moved out, but five moved in. None of the five went into the basement, for the hegira of accessories was so great that the basement was left vacant. The Concert Hall in which cars were staged, likewise was abandoned, or rather given over to the restaurant, which occupies it during normal periods.

The decorative scheme remains unchanged. The "Oriental garden" is there for all who care to decipher it, and the big commercials, and the little ones, look quite as well beneath the three-ton sky of red and gold, as beneath a sky of any other hue. There is much that is picturesque in evidence. The collection of trucks is a varied

one; they are of all shapes and all sizes. Despite its spectacularity, however, it is a strictly business show; most of the men who attend are interested from the standpoint of their pocketbooks. There are many of them, but of course the attendance, though gratifying, does not compare with the crowds that flocked the previous week.

It is the second time in the history of the automobile industry that New Yorkers, and others who have foregathered in the metropolis, are being treated to an automobile show confined exclusively to the exhibition of commercial vehicles. When last year the doors of Madison Square Garden were closed after the first annual commercial vehicle show expressions of the complete success of the venture were unanimous, and it is perhaps needless to state that the present exhibition is even greater from every point of view.

As has been remarked by some one or other, "the world do move" and that it has come to be realized that for trucking purposes the extemporized pleasure car chassis is practically useless is evidenced by the display at the Garden. "Pigs is pigs," wrote Butler, and similarly it can be said now, at least, that "trucks is trucks;" it has not taken long to instil the lesson that specialization in the design of vehicles for the transportation of merchandise is the only sure route to success. Of course, there are any number of light delivery wagons which are but adaptations of pleasure car chassis and it is only fair to add that where they are confined to the carrying of light loads they are performing in a very creditable manner. But for real trucking work—grueling, pounding and overloading—a real truck is necessary; a truck that has been especially designed for the purpose and which embodies little in common with the pleasure car. And, briefly, this is the type of commercial vehicle that is on display at the Garden.

There is a liberal sprinkling of special

adaptions, just as there was last year, and these serve to enlighten the scene not a little. Two of them in particular never fail to attract a crowd for the simple reason that both are in constant operation, and there is hardly any one, no matter how old or how blase, to whom the fascination of seeing the "wheels go 'round" does not appeal. Both are big end dumping trucks, one a Sampson and the other a Mack. On the former, a chubby lad decked out in bottle green, apparently never tires of turning the valve that lets compressed air into a cylinder, which raises the body and thus ostensibly "dumps" the load. Afterward the body is lowered to its normal position as softly and as easily as can be imagined. The Mack truck is raised by the engine itself through the intermediary of suitable gearing and on both of them there have been hung big signs advising the showgoers to keep their heads clear of the machinery.

Then there are other special adaptations as well. There is a great long White truck with a trailer which jointly support a really tremendous load of lumber; there is a queer-looking Mack truck which on investigation reveals itself as a portable army water filter; there is a giant Hewitt brewery truck heavily laden with beer kegs; there are Pope-Hartford and Locomobile and Knox and Saurer fire apparatus, and almost any number of other special adaptations equally as interesting, not to mention the famous Packard "prairie schooner," which, it is said, crossed the broad American continent in just 46½ days. It stands right at the entrance to the Packard exhibit, dirty and covered with cards and tags, and painted initials, just as it came in off the road. As a matter of fact, the show is largely a show of special adaptations. There are stock models aplenty, it is true, and it is a matter of common knowledge that even those manufacturers who exhibit special bodies also build and market numbers of

cars that are not special in any way, but the fact remains that many of the vehicles that are displayed—at least those on the main floor—have been developed to suit special requirements.

For instance, there is the special Mack dumping truck which has been mentioned previously. This particular type of truck is built in any capacity from one to seven

the older models and three brand new ones rating one, one and one-half and two tons, respectively. Many of the distinctive Mack features have been incorporated in the new models, but they have their motors out front under a hood and differ radically from their predecessors in that they are of the left-hand drive and center control variety. Also they incorporate Hele-Shaw

which characterized them long before their manufacture was taken up in this country. It is interesting to note that there have been remarkably few changes in the construction of these trucks for the past five years. Probably their most distinctive features are the use of novel type of carburetter with two nozzles, one of which only comes into use when maximum power is required, the engine-starting device and the so-called motor brake. The engine-starter is of the compressed air type and is substantially the same now as it was when it was brought out first. The motor brake, as its name suggests embraces a method of using the motor to retard the progress of the truck and the system is more than ordinarily ingenious. Briefly, the hand throttle lever on the steering wheel is interconnected with the camshaft which is so arranged that the timing of the valves can be changed so as to permit the motor to exert the maximum retarding effect. Before the timing can be changed, however, the throttle lever must be placed in the fully closed position. As it is moved further around it opens a by-pass admitting pure air to the cylinders and at the same time alters the timing of the valves, the amount of retardation obtained corresponding to the position of the throttle lever. As heretofore, but two chassis are built— $4\frac{1}{2}$ and $6\frac{1}{2}$ tons capacity.

The Sampson dumping truck is another special adaption and it has the distinction of being absolutely new in conception and design. That is to say, the dumping arrangement is new; the chassis is the stand-



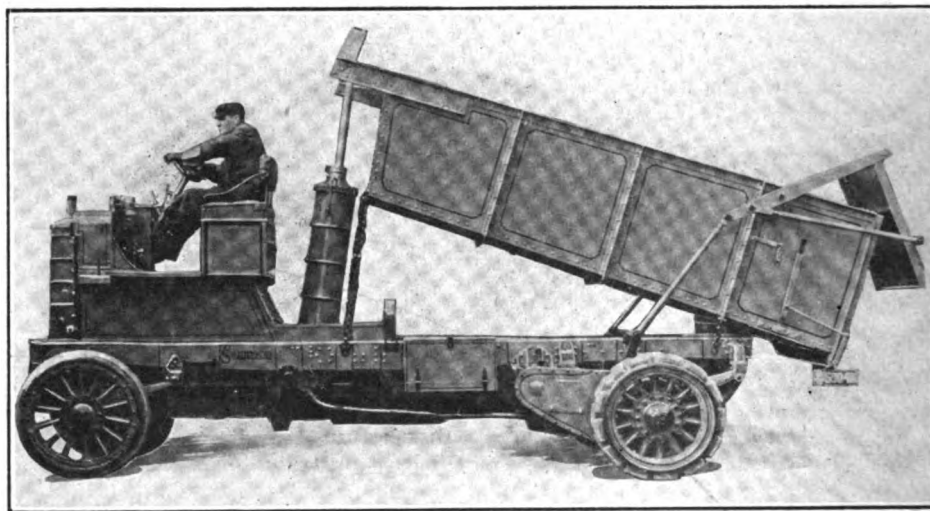
UNIQUE MACK EXHIBIT A PORTABLE ARMY FILTER

tons, and has been developed especially for road contract work. It can be dumped, it is claimed, in 30 seconds, and the beauty of it is that the whole operation is controlled by the driver while he sits in his seat. The hoisting mechanism is delightfully simple, too, though this does not necessarily imply that it is frail. As a matter of fact, Mack trucks always have been distinguished for the substantial construction and the dumping truck which is shown is no exception to the rule.

The hoisting device is mounted on special braces attached to the back of the cab and the mechanism is operated by means of a transverse shaft mounted below, and in the same plane as another shaft near the top of the cab. The lower shaft is worm driven from a small counter shaft situated in the change gear case. This shaft is rotated by means of a spur gear which meshes with the second speed gear in the transmission when the hoist is to be used. A small lever at the side of the driver serves to enmesh this gear, and, the gear shift lever being in the low-speed position, the clutch is left in and the body rises. When it reaches its upper limit, an automatic stop prevents damage resulting to the mechanism. When the body is being either raised or lowered, however, the position of the small lever which enmeshes the hoisting pinion is in such position that it is not possible to drive the truck ahead or backward; the body may be raised to any intermediate height and the truck moved.

As for the rest of the Mack line, several small alterations have been made in

multiple disk clutches instead of the cone clutches which are used in the older trucks. The Mack patented change gear mechanism in which all the gears are constantly in mesh is retained. In the older models



SAMPSON FIVE-TON CHASSIS WITH PNEUMATIC DUMPING BODY

with the motor under the driver's seat Bosch dual ignition now is used, and the clutches are keyed instead of being fitted over square shafts. These changes together with the addition of a governor constitute practically the only deviation from previous practice.

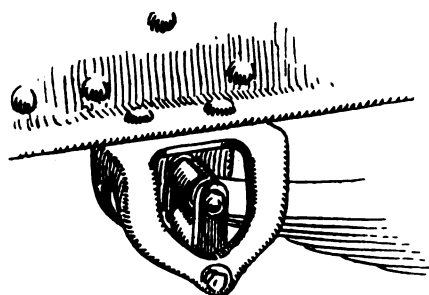
Saurer trucks which also are a product of the International Motor Co., are shown in conjunction with the Mack vehicles and present the same appearance of ruggedness

and Sampson five-ton model and is substantially as it has been in the past, except that to permit of greater in-loading the 42-inch rear wheels have been replaced by 36-inch wheels.

The truck is dumped pneumatically, a cylinder behind the driver's cab serving to raise the body and to permit it to settle again into normal position without jar. Air to operate the cylinder is stored in a tank hung from the chassis, and its admission

and exhaust are controlled by means of a Westinghouse type of air valve located within reach of the driver's hand. The pump by means of which the air is compressed has a single cylinder and is operated from the change-gear mechanism; a clutch serves to connect it to its drive shaft when the pressure in the tank drops and to disconnect it when the required 60 pounds has been obtained. One of the interesting features of the arrangement is that the air compressor may be connected directly to the pneumatic hoist in case the storage tank becomes punctured or the air line leaks. The remainder of the Sampson line scarcely has been altered at all as regards its constructional details. The one-ton model has been dropped, however, and its place taken by a new truck rated at one and one-half tons capacity.

Though either of the dumping bodies which have been described may be used for almost any purpose which requires that material be quickly unloaded, several man-



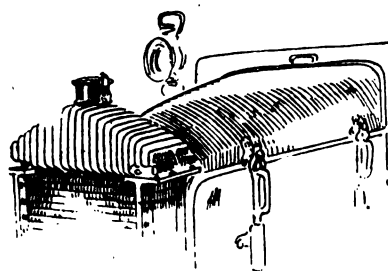
NEW ALCO SPRING HANGER

ufacturers have turned their attention to the production of vehicles for the transportation of coal in particular, and of these the Speedwell, the Alco and the Morgan trucks are excellent types which differ considerably in their essential features.

In the Speedwell truck, which is of four-ton capacity, dumping is effected by means of a motor operated rack and pinion mechanism, which in turn takes its motion, through double reduction spur gearing, from the propeller shaft. Though the body is exhibited on a four-ton chassis it also is supplied on the six-ton model; these two sizes composing the line of heavy vehicles which bear the Speedwell name-plate. Neither of them have been changed except for the addition of a differential lock and the substitution of an Eisemann automatic advance magneto for the Bosch magneto which last year was standard equipment. Motors in both the chassis are located under the driver's seat, and the distinctive construction whereby the seat and cab may be tipped sideways to permit of motor inspection or adjustment is retained. The line also includes a light delivery wagon built over the well-known pleasure car chassis with certain modifications to accommodate it to the class of work for which it is intended.

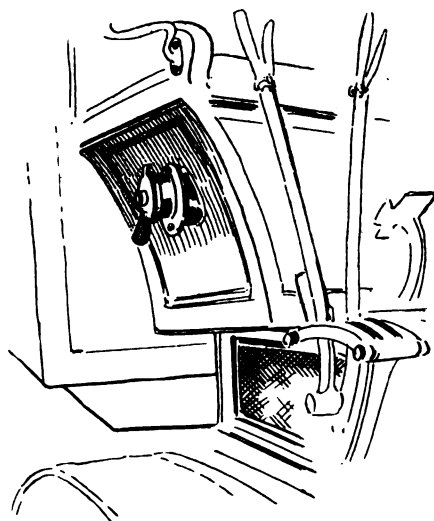
The Alco dumping body is mounted on an entirely new chassis which is rated at

6½ tons capacity, and which just has been added to the line. To the 3½ and 5-ton trucks which heretofore have constituted features of the line. Both the older models have undergone slight revision during the past year, the most noteworthy change



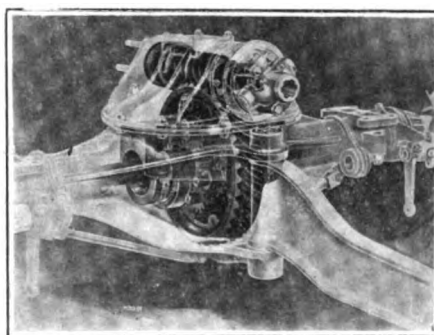
NEW PIERCE-ARROW RADIATOR

the line there also has been added another new model rated at two tons capacity. Needless to say both new models reflect the same substantial construction and un-



MACK IGNITION SWITCH LOCATION

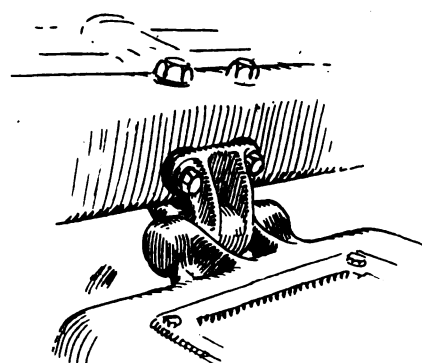
usually high factor of safety which in the past has been one of the distinguishing being the adoption of a new governed motor rated at 40-horsepower instead of the 25-horsepower engine that has been



PIERCE-ARROW WORM DRIVE

used in the past. The new motor is of the L-head type with the cylinders cast in pairs, and measuring five inches bore and six inches stroke. The same motor is used in all the three larger models; the 25-horsepower is used in the new two-ton

truck. The method of supporting the motor and transmission on all the models also has been modified, and embraces the use of a sub-frame for the motor and a three-point support for the gear-set. The clutch has been refined and the pressure required to keep it engaged has been reduced practically 50 per cent.; the service brakes now are on the jackshaft instead of the rear wheels, and the steering mechanism has been modified to eliminate road shocks being transmitted to the driver. One of the smaller changes lies in the use of a slightly raked steering column instead of the perpendicular column used heretofore. Other changes which have been made and which are calculated to place the line on an even higher plane of excellency than before include the adoption of a spring suspended radiator mounting, the substitution of an I-beam section front axle for the rectangular section and the adoption of a new type of spring hanger, which, it is claimed,



LOCOMOBILE GEAR BOX SUPPORT

increases the efficiency of the springs materially.

Strictly speaking, the body shown on the Morgan five-ton chassis is not a dumping body in the sense that it is up-titled to discharge its contents. Instead, the body remains stationary and the load—the truck is designed especially for the transportation of coal—is discharged by means of an ingenious chute containing a screw conveyor operated by the motor. Power to operate the screw is obtained from the change-gear mechanism by means of an extra gear and a shaft to a chain wheel mounted at one side of the chassis. A very much larger chain wheel is mounted on the end of the conveyor shaft to which it is fastened by means of a key. The withdrawal of the key permits the chain and wheels to rotate idly while the truck is being driven. As regards the construction of the chassis itself, it differs but little from standard practice, as exemplified in previous Morgan machines, and is characterized by its steel wheels, the rubber-cushioned jackshaft drive and a number of other excellent features which have served to identify Morgan trucks in the past. The three-ton chassis also is much the same as heretofore except for the addition of brake equalizers, and auxiliary rear springs and the adoption of slightly heavier radius

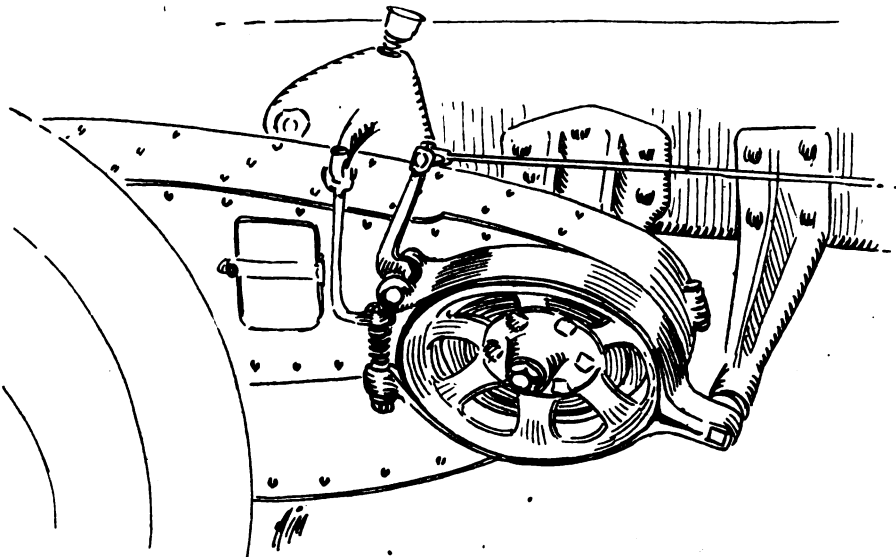
rods; these changes apply to both models. As has been the case with so many other lines, the Morgan line has been increased by the addition of a new model which is rated at two tons capacity.

The Pierce-Arrow body which is shown

feature of the truck. There is the shaft drive, for instance, which eliminates side chains and sprockets, which feature alone is worthy of considerably more than passing interest. The change gear mechanism is characteristic of other Pierce-Arrow con-

Of other types of special adaptations there are not a few, though it is unlikely that any attracts greater attention than the five-ton White lumber truck with its trailers. As a matter of fact the White company always has been noted for the extent to which it has developed the productions of special vehicles for special purposes, though the lumber truck is one of the most noteworthy of its late achievements. In the first place the truck half of the assembly, or rather two-thirds, is a brand new model which just has been added to the line. Heretofore three tons capacity has been the largest truck in the line. Except for the fact that the new model employs the well-known White 40-horsepower motor and is of the left-hand steer variety it is very similar to the older models and incorporates among other things the same type of steel wheels and the distinctive underhung rear spring suspension. The trailer is a high, two-wheeled device shod with steel tires and equipped with brakes operated by means of a lever from the driver's seat; it is connected to the truck by means of chains. The remainder of the White line, embracing models ranging from 1,500 pounds to three tons capacity remains practically without change.

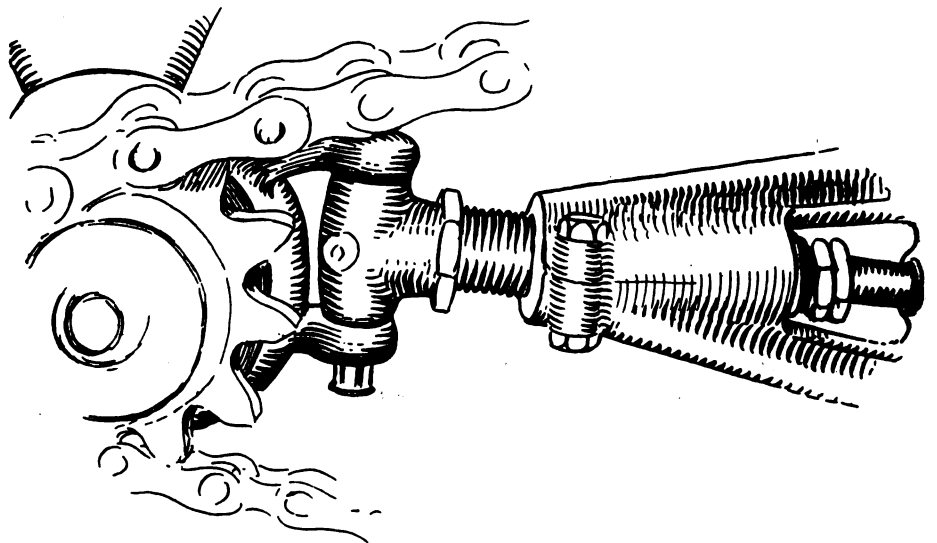
One of the features of the show which cannot help but have impressed the individual of an investigating turn of mind is the comparative scarcity of trucks of greater than five tons capacity. But there really is nothing remarkable about it though, for as one engineer put it, "when



LOZIER CHAIN CASE AND LOCATION OF BRAKES

is quite different from any of the others in that the body is tipped by hand wheel through a screw and nut mechanism. The type of body displayed is particularly adaptable to the handling of coal or other material which must be unloaded at low levels, though several other styles of tipping body adapted for a variety of purposes are supplied on demand. But one style of body which is of the platform stake type is regularly supplied, however. Mechanically, the Pierce-Arrow chassis is almost exactly identical with its immediate predecessors, there having been found little need for change or improvement beyond a nominal refinement. Its principle feature, of course, is the worm drive which construction made its first appearance for heavy commercial vehicle work in the Pierce-Arrow products. That it has given universal satisfaction is amply attested by the mere fact that it has not been found necessary to change either the design or the construction of the mechanism since its adoption several years ago. One of the interesting features of the exhibit consists of a complete worm and wheel with its housing partly cut away to show the operation of the mechanism. Varied are the comments which are passed on it, but the one which is heard most frequently concerns its wonderful accuracy and the degree of ease and smoothness with which it works. Incidentally it serves as proof positive that it really is reversible and those who are so inclined—and there are not a few who are—may cause either the worm or the wheel to drive the other with equal ease and smoothness of action. As distinctive and exclusive as the worm drive is, however, it is not the only excellent

construction and typifies the careful thought and attention to detail which everywhere is in evidence. Three speeds forward and reverse selectively obtained are provided and an automatic stop prevents gears being shifted until the clutch is fully disengaged. Another of the distinctive features with



NEW GARFORD QUICK-ADJUSTABLE RADIUS ROD

which the truck bristles lies in the use of a ratchet stop on the service brake drum which takes the place of the usual drop sprag. Externally, the appearance of the truck, which it might be added is made only in five-ton capacity, is equally as suggestive of careful workmanship. It has been changed slightly within the past year, however, by the adoption of a new type of radiator top with radially cast cooling fins.

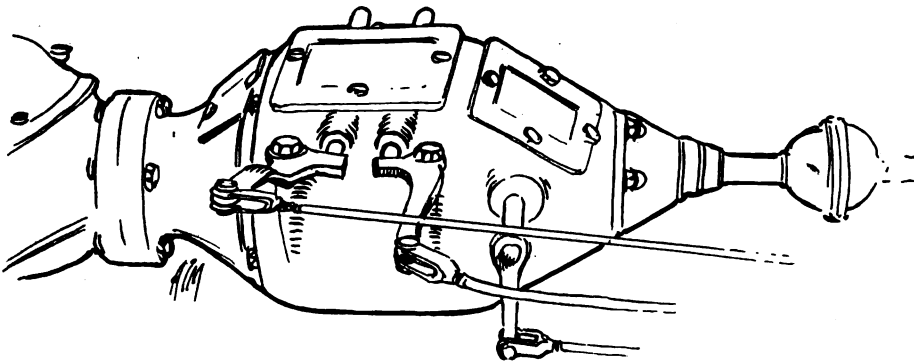
you get above five tons you run up against a problem—a bunch of problems." Despite this fact five manufacturers who exhibit at the Garden list trucks which are rated above the five-ton figure.

Of these five the massive Hewitt 10-ton truck chassis which is shown undoubtedly provokes the greatest comment. As was the case last year, it is the largest truck that is exhibited, and its position close to a one-ton vehicle of the same make serves

to accentuate its great size. Little or no change has been made in the line, though as a line it has been increased in size by the addition of a new five-ton model which is substantially the same as the previous models except that it employs a selectively operated change-gear mechanism. Also \$500 has been lopped off the price of the 5½, 7 and 10-ton models, the new chassis prices being \$4,500, \$5,000 and \$5,500, respectively.

Other than the Mack, Saurer, Speedwell and Hewitt products, the Knox line is the only one in the gasoline propelled class which includes a model rated at more than five tons capacity. This is a new model which just has been added to the line and differs from the others only in minor respects, excepting, of course, that it is larger and heavier throughout. Another new

being hung from the top half instead of the bottom half. Another radical departure from previous Locomobile practice lies in the use of a dry multiple disk clutch; it is arranged as a unit and may be removed intact without the necessity for disturbing any of the other parts. Fixed spark ignition is used and the suspension of the motor is unique. Two tubular members, one for the front and one for the rear are used, and these are flexibly mounted in sockets in the chassis frame. The motor is mounted on these in such a way that it is practically insulated from frame weaving. Final drive is by exceptionally large side chains fitted with chain cases. Though but a single five-ton model now is manufactured, a three-ton model is practically ready for the market, and will be added to the line in the near future.



McINTYRE FULLY ENCLOSED PLANETARY GEARSET

model rated at two tons capacity also has been added and it differs from the other trucks in the Knox line principally in that the motor is located up front under a hood. Still another addition to the line is the Martin tractor. This is a three-wheeled vehicle employing the conventional Knox motor and is designed primarily to serve as one support for a loaded trailer. Of the other cars in the line, the five-ton model has suffered the greatest alteration, this being the adoption of a motor in which the cylinders measure 5½ inches "square" instead of the 5 x 4¾ motor that has been used in the past. Practically the only other change of importance which has been made is a general increase in the size of the tires on all the models.

The five-ton size of truck apparently is the most popular and several brand new ones which have been placed on the market within the past year are exhibited for the first time. One of these is the Locomobile and as might be inferred it presents an appearance thoroughly in keeping with the enviable reputation for excellence of workmanship and design that has accrued to the manufacturer's pleasure cars. But though the new truck does resemble its pleasure car brothers in workmanship and finish it has nothing else in common with them barring only the employment of a phosphor bronze gear case. Even the construction of the case differs from that which is used in the pleasure car chassis, the shafts

Another of the newcomers in the five-ton class is the Lozier, and in this truck too are revealed a number of excellent features. By reason of the construction of the main frame, an exceptionally low hung effect is obtained without the necessity for increasing the tread above normal. Another of its exclusive features is that the motor, change gear mechanism and driver's seat are supported on a sub-frame which is mounted on springs independent of those which support the chassis. The motor is placed under the driver's seat, or rather under the floor board; and is rendered instantly accessible by their removal. The motor itself is of the long-stroke type, the cylinders measuring 4¾ inches bore and 6½ inches stroke. Other excellent features which evidence the thorough manner in which the Lozier engineers have attacked the transportation problem embrace the use of a multiple disk clutch running in oil, four-speed selectively operated transmission, differential lock and unusually powerful brakes. The service brakes are located on the jackshaft outside the chain cases, where they may be gotten at quite readily for adjustment.

Of the older and more familiar vehicles in the same capacity class, the Stearns is one which scarcely needs introduction. Also it is another make which shows very little alteration and therefore indicates a full measure of confidence in previous design and construction. The motor is located in

front under a hood and is of the true long-stroke type, the cylinders measuring 4¾ inches bore and 6 inches stroke. Perhaps its most distinctive feature is its motor and transmission suspension. All the elements of the power plant and transmission are mounted on a sub-frame, which is carried by semi-elliptic springs on the main chassis frame. Left-hand control is one of the new features this year and another is the adoption of a differential lock operated by means of a lever carried on the gear shift quadrant.

Though but a single five-ton Peerless chassis is exhibited, this well-known line also includes three and four-ton vehicles. The five-ton chassis, however, exemplifies the high-class of workmanship which characterizes all the vehicles that bear the Peerless name plate. During the past year no improvement has been found to be possible and the three models remain substantially the same, except for such minor refinements as have been dictated by experience and the policy of the company to maintain its products at the very top notch of perfection.

Garford is another name which stands for all that is right and proper in motor truck construction. Heretofore these trucks have been distinguished as being among the few makes in the higher capacity class which employed friction transmission. However, this unique system has been dropped except in the one-ton model, in which there is practically no change. The older two- and three-ton models also will be equipped with Garford friction transmission, at the option of the purchaser. Three new models have been added to the line, and though their design and construction is substantially the same as their predecessors, they differ from them essentially in the employment of four-speed selective type change gear mechanisms in which third speed is direct drive and fourth speed is an overstep. The new models are of 1½, 3½ and 5-ton capacity, the motor being arranged under the seat in the two larger models and under a hood in front in the 1½-ton chassis.

Two large spaces are required to exhibit the extensive line marketed by the General Motors Truck Co. It might perhaps be well to add that the line is in reality two lines merged into one. The two brands, which now are marketed as the product of the newly formed company, are the old and well-known Rapid and Reliance, both of which have acquired a reputation for consistency. Concretely the line embraces models ranging in capacity from one to five tons. That portion of the line which heretofore has been known under the name of Rapid, retain their essential characteristics, but have been slightly modified. To the casual observer the most apparent change is the elimination of the chain cases from the two smaller models; otherwise they reflect very little alteration. Such changes as have been made in the three-ton

model embrace the adoption of a governor and new type of radiator and the location of the gear shift lever outside the chassis frame. The other half of the line—known in years gone by as the Reliance—is made in sizes of from 2½ to 5 tons capacity. Several changes calculated to increase the efficiency of the vehicles have been made, though none of their essential features have been altered beyond recognition. Thus, for instance, the motor now is mounted on



THE WORM-DRIVEN PIERCE-ARROW FIVE-TON TRUCK

a sub-frame which is supported on three sides on the main chassis frame. Similarly a new type of radius rod, which permits of quick adjustment, has been adopted, and a brake support, intended primarily to reduce rattling and wear, has been added to the jackshaft brake.

Among those vehicles which properly belong in the lighter class, namely three tons capacity, the Pope-Hartford is one which has attained an enviable reputation for reliability and efficiency. Designed with care and with very evident attention to the requirements of commercial vehicle work, this line also shows only slight variance from the construction which has served to distinguish it in the past. Practically the only changes which have been made are embraced in the use of larger and more powerful brakes and the adoption of a heavier type of radius rod, which raises considerably the ordinarily high factor of safety. A single chassis, rated at three tons capacity, is the only one which is manufactured and in it are retained the same distinctive low speed motor, conspicuously accessible, the same three-speed selective transmission, and the same efficient type of leather faced cone clutch with cork inserts.

As was the case last year, the Packard exhibit occupies a greater space than any other single exhibit in the Gardner. It is more than ordinarily impressive, including as it does no less than seven trucks of the well-known three-ton type. In addition, a brand new two-ton model is shown for the first time. Except for the fact that its construction is lighter throughout and it employs a Packard "18" motor, it is identical with the larger chassis. One of the interesting vehicles shown with this line is the

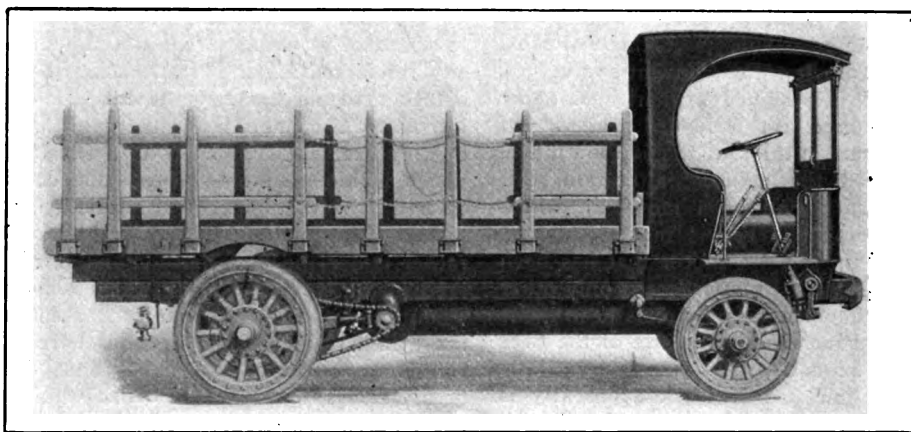
Packard "Prairie Schooner," which, it is claimed, was the first motor truck to make the strenuous trip across the continent under its own power; the journey required forty-six and one-half days. The Packard three-ton truck is, of course, familiar, particularly by reason of the fact that such a great number of them are in use in New York and other large cities. It is suggestive that during the past year it has not been found necessary to alter the design or con-

been replaced by a four-cylinder vertical motor which reflects the very latest and best engineering practice. Despite the fact that the motors are radically different in design, many of the distinctive Grabowsky features, such, for instance, as the use of hardened steel bushings, are retained. Quite as important in its way as the change which has been made in the motors is the replacement of the planetary change gear mechanism which previously has been used by three-speed selectively operated gear-sets. As in the past, motor, clutch and transmission are a unit mounted on a sub-frame which may be quickly and easily removed. There has been added a new model of five-ton capacity, the complete line now including 1, 1½, 2, 3 and 5-ton models.

As usual, the Auto car display is exceptionally comprehensive and includes no less than seven separate and distinctive types of body, all of which have been developed for separate purposes. Prominent among them is a commodious 12-passenger flush-sided "Tourer." In this modified bus all twelve of the passengers face forward, entrance to the seats being possible only from the left side. The Auto car line is another in which the attention of the manufacturers has been concentrated on the production of a single chassis; it is rated at 3,000 pounds capacity. Except for the fact that a new type of pedal has been adopted and an accelerator pedal has been added, little change from previous practice is evidenced. The same distinctive two-cylinder opposed motor, located under the driver's seat, is retained, as is the patented and therefore

struction of the chassis at all. An automatic spark retarding device, which operated to retard the spark when the starting crank is placed in position to be used, and therefore obviates the possibility of accident, has been added. Otherwise the chassis is unaltered and presents the same sturdy construction that always has characterized it.

The Grabowsky line is one of the few



STANDARD STAKE BODY ON FIVE-TON GARFORD CHASSIS

which reveals radical changes in both design and construction throughout. In view of the eminent satisfaction which these cars have given in the past, however, the changes which have been made scarcely can be construed to mean that the design heretofore used has been anything but satisfactory. Rather, the changes are in direct line with the policy of the manufacturers constantly to make an even better truck which always has been, good. The two-cylinder opposed power plant, which heretofore has been used in all the models, has

exclusive double reduction final drive.

The McIntyre line, which heretofore has been characterized by a two-cylinder opposed motor, this year has been increased in size by the addition of three new models, all of which employ four-cylinder vertical motors. The new models are rated at one and one-half, two and three tons capacity. The 600-pound "Handy Wagon," which last year formed the only air-cooled member of the family, has been dropped. In the older two-cylinder models the planetary transmission now is enclosed and the service

brake has been taken off the rear wheels and put on the jackshaft. Except for one other little alteration, the addition of an auxiliary cross spring, the line is substantially the same as heretofore.

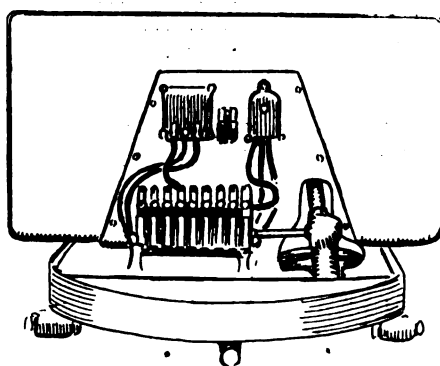
In the still lighter class of vehicles, the Flanders "20" delivery car is brand new. As its name suggests, it is a Studebaker product built around the famous Flanders "20" pleasure car chassis. The chassis itself, of course, is well known, and except for slight modifications, better to adapt it to the work for which it is intended, it is practically without change. A panel top delivery body regularly is supplied on the chassis, the rated capacity of the vehicle being 750 pounds. Other cars which are in practically the same capacity class embrace such well-known products as the Cartercar, the Brush, the Reo and the Buick. The Cartercar, of course, is distinctive by reason of employment of friction transmission. Similarly the Brush and Reo cars also are distinctive in that they incorporate single cylinder motors. Neither of them has been changed materially. The Brush is the same handy little wagon that it always has been and incorporates the same selectively operated planetary transmission and unique spiral spring suspension. The only change which has been made in the Reo 1,500-pound delivery truck is embraced in the addition of mudguards; the 600-pound model, which last year was included in the line, has been dropped. The Buick is another car of the same general class, though its rated capacity is a little bit greater. A slightly heavier chassis frame, the adoption of a drip forged I-beam section axle instead of the tubular member which was used last year, a heavier jackshaft, and, in fact, heavier construction throughout, has raised the capacity to one ton.

All the electric vehicles are exhibited in the balcony, and the number is by no means small, there being no less than eight exhibitors showing a total of thirty-one cars. Prominent among these are the products of the General Motors Truck Company, newcomers in the field, which are of special interest because of the unusual accessibility of their vital parts. The battery box is placed above the low-hung frame and the controller is under a small hood in front of the dashboard. There is nothing on the machine that needs adjustment or that can be adjusted except the brakes and chains, the adjustments of which are simple. Drive from the motor to the jackshaft is by a flat steel spring which takes the place of the more conventional propeller shaft, and affords a cushioning effect. G. M. C. cars are built in sizes carrying from half a ton to six tons; battery equipment is optional.

The Lansden truck, though well-known, now comes in a new form, having been redesigned throughout. Comparatively short chains for final drive replace the long chains that have for so long characterized these cars, and silent chains are used between motor and jackshaft instead

of roller chains. The frames now are of steel instead of wood. A new suspension carries the motor from a single cross-member instead of from two; sprockets are keyed and tapered on instead of being pinned; a ratchet retainer holds the brake when applied; Timken rollers take the place of bronze bearings, and the controller is of the open type instead of being enclosed. By means of a new method of attachment, wheels can be removed in a very few minutes, and as quickly replaced.

Minor changes have been made in all the Baker electric models except the largest, which has a capacity of 5,000 pounds, the other extremity of the range being 1,000 pounds. Emergency brakes, mounted on the countershaft, have been added and distance rods have been redesigned and



G. M. C. ELECTRIC CONTROLLER

made somewhat heavier and more flexible. All bearings are now bronze bushed. Sprockets are reversible, so that when the teeth are worn on one side they can be turned and the practically unworn faces used; controllers are now enclosed.

A new 1,000-pound capacity wagon has been added to the Waverley line, this vehicle having shaft drive and an Edison storage battery. All previous Waverley cars for commercial work have been of the chain-driven type. The new machine is specially designed for light work and is of small size, and therefore is easily housed.

An entirely new line of electric wagons of capacities varying from 800 pounds to four tons is manufactured by the Bronx Electric Vehicle Co., all being driven by single motors through silent chain drive to a countershaft, and thence to the rear wheels by roller chains. A special point is made of straight line drive from the countershaft to the rear wheels, with the result that considerable noise and chain "slapping" is eliminated. All bearings, both in wheels and motors, are non-adjustable annular Hess-Brights, the hub bearings being enclosed in dust-proof casings which act also as oil retainers. The heaviest of the Bronx vehicles have channel steel frames, the others having light, but strong pressed steel frames; battery equipment is optional.

No new models have been added by the builders of the Ward car, and only slight changes have been made in existing ma-

chines. The old style plain bearings have been replaced by Timken roller bearings and Exide "Ironclad" batteries replace the grid-plate style formerly used.

The Detroit electric car is another that has been found good enough to let alone in practically all details. The company has, however, brought out a new model having a carrying capacity of 1½ tone, and two other machines, having capacities of two tons and three tons, respectively, soon will be ready for the market.

Apart from enclosing the Morse chains of the primary drive, hitherto run uncovered, the General Vehicle Co. has made practically no changes in its very complete line of electric delivery wagons and trucks. A new model has been brought out, however—a low-wheeled special baggage truck of 2,000 pounds capacity, with a platform in front for the driver to stand on; steering is accomplished with the rear wheels and the drive is through the front wheels. The controlling devices are somewhat unusual and correspondingly interesting. The brake pedal, which has a long crosswise foot-piece, occupies a place in the center of the operating platform; when the pedal is up the brake is on, and it is necessary for the driver to depress it with his foot in order to release the brake. The steering control is by means of a lever on the left-hand side, having vertical motion only, and a corresponding lever on the right side operates the controller. The battery is sufficient to run the truck twenty miles on a single charge, and is suspended in a cradle at the front.

Summary of the commercial vehicles shown at the Garden:

Gasolene.

Alden Sampson Mfg. Co., Detroit, Mich.—

Four Sampson trucks and one Sampson chassis. One each five-ton, three-ton, one-and-one-half-ton, and one-half-ton trucks.

American Locomotive Co., New York—

Two trucks. One each five-ton, two-ton truck, and one three-and-one-half-ton chassis.

Autocar Co., Ardmore, Pa.—Seven two-cylinder opposed, one-and-one-half-ton Autocar delivery wagons and one chassis.

Brush Runabout Co., Detroit, Mich.—Two single-cylinder 800-pound delivery cars, one chassis.

Buick Motor Co., Flint, Mich.—Eight two-cylinder, double opposed Buick trucks, all of one-ton capacity.

Cartercar Co., Pontiac, Mich.—Three two-cylinder double-opposed Cartercars of 1,500 pounds capacity.

Garford Co., Elyria, Ohio—Two five-ton Garford trucks, one five-ton chassis.

General Motors Truck Co., Detroit, Mich.

—Five four-cylinder, Rapid and Reliance trucks. One each five-ton, three-and-one-half-ton, three-ton, two-ton and one-ton and one three-and-one-half-ton chassis.

Grabowsky Power Wagon Co., Detroit,

Mich.—Three Grabowsky trucks. One each five-ton, three-ton and one-ton trucks, and one three-ton chassis.

International Motor Co., New York City—Six International trucks. Two seven-and-one-half tons, one five-ton, one three-ton and one one-and-one-half-ton Mack trucks; one four-and-one-half-ton Saurer fire patrol and one six-and-one-half-ton chassis.

Knox Automobile Co., Springfield, Mass.—Four Knox trucks and one Martin tractor. One each six-ton, five-ton and one-and-one-half-ton trucks, one two-ton fire apparatus.

Locomobile Co., of America, Bridgeport, Conn.—One five-ton Locomobile chassis, one special fire apparatus.

Lozier Motor Co., Detroit, Mich.—One five-ton Lozier chassis.

Metzger Motor Car Co., Detroit, Mich.—One Hewitt seven-ton brewery wagon; one ten-ton, one three-and-one-half-ton and one one-ton Hewitt chassis.

Morgan Motor Truck Co., Worcester, Mass.—One five-ton, one two-ton truck, and one three-ton chassis.

Packard Motor Car Co., Detroit, Mich.—Seven Packard trucks. Five three-ton and one two-ton trucks, one three-ton "transcontinental" truck, and one three-ton chassis.

Peerless Motor Car Co., Cleveland, Ohio—One five-ton Peerless chassis.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Two five-ton Pierce-Arrow trucks, one five-ton chassis.

Pope Mfg. Co., Hartford, Conn.—Two three-ton Pope-Hartford trucks, one special fire apparatus.

Reo Motor Car Co., Lansing, Mich.—Three

one-cylinder, 1,500-pound Reo delivery wagons.

CENSUS OF THE GARDEN SHOW

Total Exhibitors	213
Exhibitors of Vehicles.....	32
Exhibitors of Accessories....	181

GASOLENE COMMERCIAL VEHICLES

One Cylinder	5
Two Cylinders	18
Four Cylinders	49

72

GASOLENE CHASSIS

One Cylinder	1
Two Cylinders	1
Four Cylinders	19
Three-wheel Tractor	1

22

Total Gasolene Commercial Vehicles and Chassis.....	94
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ELECTRICS

Delivery Cars	27
Chassis	6

Total Electric Vehicles and Chassis	33
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Public Service Vehicles.....	5
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Grand Total of All Vehicles and Chassis	132
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Schildwachter Carriage Co., New York—Two McIntyre trucks. One each one-and-one-half and one-ton, and one one-and-one-half-ton chassis.

Speedwell Motor Car Co., Dayton, Ohio—Two Speedwell trucks. One six-ton, one four-ton, and one four-ton chassis.

Stearns Co., F. B., Cleveland, Ohio—One five-ton Stearns chassis.

Studebaker Corporation, South Bend, Ind.—One four-cylinder Flanders' delivery car and one Flanders chassis.

White Co., Cleveland, Ohio—Seven White trucks. Two five-ton, one three-ton, one two ton, one one-and-one-half-ton and two 1,500-pound trucks.

Electrics.

Anderson Electric Car Co., Detroit, Mich.—Three Detroit electric delivery wagons. One each one-and-one-half-ton, one-ton and one-half-ton.

Baker Motor Vehicle Co., Cleveland, Ohio—One two-ton Baker electric express car, and one one-half-ton Bank wagon.

Bronx Electric Vehicle Co., New York—One one-half-ton delivery wagon, one four-ton chassis, and one one-half-ton chassis.

General Vehicle Co., Long Island City, N. Y.—Nine General electric trucks, ranging from 750 pounds to five tons, and one five-ton chassis.

Lansden Co., Newark, N. J.—One 11-passenger Lansden electric bus; one each three-ton, two-ton, and one-ton truck; one three-ton and one one-ton chassis.

Studebaker Corporation, South Bend, Ind.—One Studebaker electric delivery wagon.

Ward Motor Vehicle Co., New York—Four Ward electric delivery wagons of 700 to 1,500 pounds capacity.

Waverley Co., Indianapolis, Ind.—Three Waverley electric cars. One each half-ton, one-ton and special service wagons, and one 1,500-pound chassis.

Accessories That Mingled With the Trucks in Madison Square Garden

The demands made upon tires intended for heavy trucks spurred the tire makers on to renewed efforts, and the latest products of their art now are on view on the balconies of Madison Square Garden. In the booth of the Firestone Tire & Rubber Co., are several new types of solids, all of them, the Firestone people explain, developed as the result of conferences with makers and users of trucks, and not of a desire to force home their own ideas. Among the new comers are single and dual hard-base-channel type solid tires, single and dual metal-and-hard-rubber base tires of the European type, manufactured according to S. A. E. standards, and block tires for extra heavy duty are shown alongside of a new style of side wire cushion tire for electric vehicles. The company also exhibits a new dual demountable truck rim, its well-known non-skid tread and heavy smooth tread pneumatics. The Diamond Rubber Co., of Akron, Ohio, shows several styles of single and dual wire mesh base tires guaranteed for 8,000 miles; single and

dual side wire solid for medium heavy work, and clincher type solid tires for light delivery service.

Diagonal block tires for extremely heavy service, a new demountable rim for solid tires, and a new dual sectional block tire form the additions to the exhibit of the Goodyear Tire & Rubber Co. Block solid tires of slightly different shape and construction are shown by the B. F. Goodrich Co., side by side with a demountable dual tire, for which its makers claim several important advantages. The Fisk Rubber Co., of Chicopee Falls, Mass., also shows a new block solid tire together with dual pneumatics for medium heavy trucks and delivery wagons. The United States Tire Co. has added to its exhibits a number of its new demountable rims, while the huge "Nobby" tread 38 x 8 pneumatic truck tire never fails to stop even the most cursory passer-by. "Staggard" tread solid tire for electrics and a new side wire, hard-rubber base, solid truck tire are exhibited by the Republic Rubber Co., of Youngstown, Ohio.

Solid truck tires and demountable rims, as well as cushion tires and non-skids, are shown at the Firestone stand.

The advent of the heavy trucks naturally gave the parts makers, especially the manufacturers of axles and transmissions a chance to show the capabilities of their factories, and as a result some high-class work in this line is exhibited. At the booth of the American Ball Bearing Co., for instance, front and rear axles complete with differentials, brakes and brake drums are shown in sizes up to seven tons truck capacity. In the Timken Axle Co.'s stand near by a similar line of axles complete with brakes, drums, sprockets, radius rods, jackshafts with and without transmissions is shown; the rear as well as front axles are bolted onto the hubcaps, while all axles are fitted with Timken roller bearings, which are shown in sizes up to ten-ton truck capacity. A new heavy type transmission for trucks is shown by the Brown-Lipe Gear Co., together with a five-ton differential which is the largest differential

turned out in their factory, as well as a number of differential gears which form a specialty of this company's product. Multiple disk clutches, crankshafts and truck frames are the offerings of the A. O. Smith Co., of Milwaukee, the frames being small nickel plated models.

Heavy steering gears, a four-speed change gear mechanism for a seven-ton truck, a unit (differential, transmission and gear box) for heavy trucks, multiple disk clutches and power plants ready to be bolted onto any standard motor, such as Continental or Rutenber, form the exhibit of the Warner Gear Co., Muncie, Ind.

The Standard Welding Co., of Cleveland, Ohio, shows a full line of Universal demountable rims, electrically welded crank shafts, gear casings, steering knuckles, large exhaust pipes and a number of electrically welded felloe bands for very heavy truck wheels. Brake drums, fans and stampings are the offering of the Sparks-Withington Co., while opposite their booth the Hercules Suspension Tire Co. exhibits a spring wheel of intricate construction, in both single and dual form for truck use. Truck radiators with extra heavy head sheets are shown by the McCord Co., whose tubular radiators enjoy a reputation second to none; the remainder of the exhibit consisting of fans and force feed lubricators.

Bodies, made out of sheet steel and applicable to light delivery wagons, are shown by the Hayes Mfg. Co., which company also exhibits a particularly complete line of tool boxes, steel stiffened truck fenders and hoods.

Ajax-Grieb Rubber Co., New York City—Ajax tires.

American Ball Bearing Co., Cleveland, Ohio—American ball bearings and axles. American Bronze Co., Berwyn, Pa.—Bronze castings.

American Circular Loom Co., Aldene, N. J.—No-Lag Magnetos.

American Metal Hose Co., Waterbury, Ct.—Flexible metal pipe.

American Oil Pump and Tank Co., Dayton, Ohio—Lubricating devices.

American Taximeter Co., New York City—Taximeters.

American Vanadium Co., Pittsburgh, Pa.—Vanadium steel castings.

Aristo Co., New York City—Mondex shock absorbers, Disco self-starters and Fray lighting system.

Ashley, James R. & Co., New York City—Portable garages.

Atlas Chain Co., Brooklyn, N. Y.—Non-skid tire chains.

Atwater Kent Mfg. Works, Philadelphia, Pa.—Uni-Sparker ignition apparatus and Monoplex horns.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone horns.

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps and generators.

Baldwin Chain and Mfg. Co., Worcester, Mass.—Baldwin chains, recoil checks and Brown steering gears.

Bantam Anti-Friction Co., Bantam, Conn.—Hangers, bearings and road guides.

Barker, C. B. & Co., Ltd., New York City—Excelsior carbureters and Black Eagle spark plugs.

Barthel, Daly & Miller, New York City—Schafer ball bearings.

Benford Mfg. Co., Mt. Vernon, N. Y.—Spark plugs and timers.

Bosch Magneto Co., New York City—Bosch magnetos and spark plugs.

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos.

Briscoe Mfg. Co., Detroit, Mich.—Radiators, hoods and fittings.

Brown-Lipe Gear Co., Syracuse, N. Y.—Transmissions, differentials and steering gears.

Buda Co., Harvey, Ill.—Motors, gears, forgings, jacks.

Byrne, Kingston & Co., Kokomo, Ind.—Kingston carbureters.

Carnegie Steel Co., Pittsburgh, Pa.—Axles, gears, springs.

Central City Rubber Co., Syracuse, N. Y.—Agalite lubricants.

Champion Ignition Co., Flint, Mich.—Coils, timers, and spark plugs.

Chandler Co., Springfield, Mass.—Nameplates and monograms.

Christian Bros. Co., Brooklyn, N. Y.—Solider and polishes.

Coes Wrench Co., Worcester, Mass.—Wrenches.

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos, spark coils, and other ignition specialties.

Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.

Covert Motor Vehicle Co., Lockport, N. Y.—Change gear mechanisms.

Cramp & Sons Ship and E. B. Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.

Cross & Co., C. J., New York City—Dayton airless tires.

Crucible Steel Co., of America, Pittsburgh, Pa.—Crucible steel castings.

Dean Electric Co., Elyria, Ohio—Tuto horns and Dynalux lighting systems.

Detroit Electric Appliance Co., Detroit, Mich.—Electric lighting apparatus and engine starters.

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Chains and sprockets.

Diamond Rubber Co., Akron, Ohio—Diamond tires.

Dixon Crucible Co., Joseph, Jersey City, N. J.—Graphite lubricants.

Dorian Remountable Rim Co., New York City—Dorian remountable rims.

Driggs-Seabury Ordnance Corp., Sharon, Pa.—Frames, crank shafts, etc.

Eavenson & Sons, Inc., J., Camden, N. J.—Soaps and polishes.

Edison Storage Battery Co., West Orange, N. J.—Storage batteries.

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Eisemann Magneto Co., New York City—Eisemann magnetos.

Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.

Empire Tire Co., Trenton, N. J.—Empire tires and brake linings.

Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.

Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carbureters.

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires and rims.

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires and rims.

Flechter & Co., L. V., New York City—"Locomotive type" carbureters.

Frasse & Co., Peter A., New York City—Tubing and tools.

Gemmer Mfg. Co., Detroit, Mich.—Steering gears and parts.

General Electric Co., Schenectady, N. Y.—Cloth pinions and electric specialties.

Gibney & Bro., James L., Philadelphia, Pa.—Gibney solid tires and electric vulcanizers.

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.

Gould Storage Battery Co., New York City—Storage batteries.

Gray & Davis, Amesbury, Mass.—Lamps and lighting dynamos.

Harris Oil Co., A. W., Providence, R. I.—Lubricants.

Harrison Radiator Co., Lockport, N. Y.—Radiators.

Hartford Machine Screw Co., Hartford, Conn.—H. M. S. spark plugs and combined cooling and inflating pump.

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, jacks and engine starters.

Havoline Oil Co., New York City—Lubricants.

Hayes Mfg. Co., Detroit, Mich.—Metal bodies and boxes.

Hercules Suspension Co., New York City—Spring wheels.

Hess-Bright Mfg. Co., Philadelphia, Pa.—H.-B. ball bearings and ball bearing grease.

Hoffnung & Co., New York City—Coventry chains and "Fastnut" lock washers.

Horseless Age Co., New York City—Publications.

Houpert, H. J., New York City—Gears and sprockets.

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt roller bearings.

Ignition Starter Co., Detroit, Mich.—Disco engine starter.

Imperial Bearing Co., Detroit, Mich.—Ball bearings.

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

- Janney, Steinmetz & Co., Philadelphia, Pa.—Engine starters and seamless steel tanks.
- J. M. Shock Absorber Co., of Philadelphia, Pa.—J. M. shock absorbers.
- Johnson & Co., Isaac G., Spuyten Duyvil, N. Y.—Forgings and castings.
- Jones & Co., Phineas, Newark, N. J.—Wood wheels.
- Jones Speedometer Co., New York City—Jones speedometers, odometers, and "recorders."
- Kells Mfg. Co., W. J., New York City—Radiators.
- Keystone Lubricating Co., Philadelphia, Pa.—Keystone oils and grease.
- Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads.
- Lee Tire & Rubber Co., Conshohocken, Pa.—Jelco-Atlas puncture proof inner case.
- Lefever Arms Co., Syracuse, N. Y.—Specialties.
- Light Mfg. & Foundry Co., Pottstown, Pa.—Aluminum parts and castings.
- Link Belt Co., Indianapolis, Ind.—Chains.
- Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns and bumpers, and Raiswell jacks.
- McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and gaskets.
- McGinnis, F. T., New York City—Broc rotary valve motor.
- Marburg Bros., Inc., New York City—Mea magnetos.
- Masury & Son, John W., New York City—Paints and varnishes.
- Mead Engine Co., Dayton, Ohio—Rotary valve motors.
- Merchant & Evans & Co., Philadelphia, Pa.—Hele-Shaw Universal clutch, Star tire jackets, etc.
- Mezger, C. A., Inc., New York City—Windshields and Soot-proof spark plugs.
- Miller, Charles E., New York City—Pan-American oils, Brampton chains and gears, and supplies.
- Modern Auto Appliance Co., Chatham, N. Y.—Anti-skid chains.
- Mosler & Co., A. R., New York City—Spitfire and Breech-block spark plugs.
- Motor World Publishing Co., New York City—The Motor World.
- Motz Clincher Tire & Rubber Co., Akron, Ohio—Motz cushion tires.
- Muncie Gear Works, Muncie, Ind.—Wheels, gears, etc.
- Mutual Auto Accessories Co., New York City—Supplies.
- National Carbon Co., Cleveland, Ohio—Dry cells.
- National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
- New Departure Mfg. Co., Bristol, Conn.—Ball bearings.
- Newmastic Tire Co., New York City—Tire filling compound, and demountable rims.
- New Miller Mfg. Co., Los Angeles, Cal.—New Miller carburetter.
- New York & New Jersey Lub. Co., New York City—Columbia lubricants.
- New York Sporting Goods Co., New York City—Supplies.
- New York V-Ray Sales Co., Syracuse, N. Y.—V-Ray spark plugs.
- Niagara Lead & Battery Co., Niagara Falls, N. Y.—Storage batteries.
- Oliver Mfg. Co., Chicago, Ill.—Peerless jacks.
- Paragon Auto Parts Mfg. Co., New York City—Radiators and sheet metal parts.
- Polack Tyre Co., Jeanette, Pa.—Polack tires.
- Perfection Spring Co., Cleveland, Ohio—Perfection springs.
- Philadelphia Storage Battery Co., Philadelphia, Pa.—Storage batteries.
- Piel Co., G., Long Island City, N. Y.—Long horns and muffler cut-outs.
- Pittsfield Spark Coil Co., Dalton, Mass.—Magnetos, coils, plugs and other ignition devices.
- Portage Ruber Co., Akron, Ohio—Portage tires.
- Prosser & Son, Thomas, New York City—Prop steels.
- Recording Speedometer Co., Newark, N. J.—Speedograph.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting apparatus.
- Republic Rubber Co., Youngstown, Ohio—Republic tires.
- Rhineland Machine Works Co., New York City—Ball bearings.
- R. I. V. Co., New York City—R. I. V. ball bearings.
- Ross Gear & Tool Co., Lafayette, Ind.—Steering gears.
- Royal Equipment Co., Bridgeport, Conn.—Band brakes, Raybestos brake lining, and Gyrex mixers.
- S. & S. Shock Absorber Co., Washington, D. C.—S. & S. shock absorbers.
- Sheldon Axle Co., Wilkes-Barre, Pa.—Axles and springs.
- Simonds Mfg. Co., Fitchburg, Mass.—Spring wheels and tools.
- S. K. F. Ball Bearing Co., New York City—S. K. F. Ball bearings.
- Smith Co., A. O., Milwaukee, Wis.—Frames, gears and parts.
- Smith Gasoline Meter Co., New York City—Gasolene meters.
- Snyder & Harbridge, Detroit, Mich.—Demountable rims, and spring wheels.
- Sonora Motor Horn Co., New York City—Horns.
- Sparks-Withington Co., Jackson, Mich.—Fans, stamping and screw machine products.
- Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.
- Splitdorf, F. C., Inc., New York City—Splitdorf magnetos and plugs.
- Stacey Mfg. Co., Wm. H., Springfield, Mass.—Perkins lighting system.
- Standard Roller Bearing Co., Philadelphia, Pa.—Standard roller bearings.
- Standard Thermometer Co., Boston, Mass.—Standard speedometers.
- Standard Welding Co., Cleveland, Ohio—Electrically welded tubing and parts.
- Start-Lite Co., Chicago, Ill.—Automatic lighting devices.
- Sterling Hardware Co., New York City—Hardware specialties.
- Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.
- Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.
- Stutz Auto Parts Co., Indianapolis, Ind.—Axles and transmissions.
- Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.
- Texas Co., New York City—Lubricants.
- Thompson Auto Co., Andrew C., Plainfield, N. J.—Engine starters.
- Timken Detroit Axle Co., Detroit, Mich.—Axles.
- Timken Roller Bearing Co., Canton, Ohio—Roller bearings.
- Torbenson Gear & Axle Co., Bloomfield, N. J.—Gears and axles.
- Tracy, Joseph, New York City—Dynamometer and testing apparatus.
- Treadwell Engineering Co., Lebanon, Pa.—Steel castings.
- Turner Brass Works, Syramore, Ill.—Brazing apparatus, tire pumps, etc.
- United Rim Co., Akron, Ohio—Standard universal rims.
- United States Light & Heat Co., New York City—Storage batteries.
- United States Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.
- United Steel Co., New York City—Vanadium steel.
- Vacuum Oil Co., Rochester, N. Y.—Vacuum Mobiloil.
- Vanadium Metals Co., Pittsburgh, Pa.—Victor vanadium bronze and "non-corrosive" silver.
- Van Auken Indicator Co., New York City—Gasolene indicators.
- Veeder Mfg. Co., Hartford, Conn.—Veeder speedometers and odometers.
- Warner Gear Co., Muncie, Ind.—Gears and parts.
- Warner Instrument Co., Beloit, Wis.—Warner autometers.
- Warner Mfg. Co., Toledo, Ohio—Motors, transmissions and steering gears.
- Wasson Piston Ring Co., Bayonne, N. J.—Wasson piston rings.
- Wayne Oil Tank & Pump Co., Fort Wayne, Ind.—Wayne oil tanks.
- Weed Chain Tire Grip Co., New York City—Weed tire chains.
- Weston-Mott Co., Flint, Mich.—Rims and wheels.
- Wheeler & Schebler Co., Indianapolis, Ind.—Schebler carburetters.
- Whitney Mfg. Co., Hartford, Conn.—Whitney chains.
- Williams & Co., J. H., Brooklyn, N. Y.—Tools and forgings.
- Wiley Co., C. A., Long Island City, N. Y.—Forgings.
- Young, O. W., Newark, N. J.—Lubricants.



INDEX TO ADVERTISERS



Abbott Motor Co.....	466	Grossman, Emil, Co.....	468	O	
Adamson Mfg. Co.....	462	H		Oakland Motor Car Co.....	463
Ajax-Grieb Rubber Co.....	459	Hartford Suspension Co.....	452	P	
American Ball Bearing Co.....	459	Haynes Automobile Co.....	464	Packard Electric Co.....	465
American Motors Co.....	465	Henderson Motor Sales Co.....	464	Parish & Bingham Co.	465
American Starter & Carburetor Mfg.		Hot-Spark Plug Co.....	396	Parish Mfg. Co.....	452
Co.	463	Hupp, R. C.....	464	Perfection Spring Co.....	452
Argo Electric Vehicle Co.....	392	Hupp Motor Car Co.....	466	Petrel Motor Car Co.....	463
Atwater-Kent Mfg. Wks.....	389	Hyatt Roller Bearing Co.....	465	Pullman Motor Car Co.....	463
Automobile Supply Co.....	459	I		R	
B		Ideal Motor Car Co.....	466	Remy Electric Co.....	460
Badger Brass Mfg. Co.....	F. C.	Ignition Starter Co.....	424d-424e	Roser, Hermann, & Son.....	467
Barthel, Daly & Miller.....	467	Inner Shoe Tire Co.....	451	Royal Equipment Co.....	468
Bartholomew Co.	459	International Accessories Corp.....	457	S	
Bicycling World and Motorcycle Re-		Inter-State Automobile Co.....	459	Sackman Mfg. Co.....	462
view	454	J		Safety Tire Gauge Co.....	452
Bosch Magneto Co.....	461	Jackson Automobile Co.....	466	Salisbury Wheel & Mfg. Co.....	456
Bossert Co.	452	Jamestown Wheel & Mfg. Co.....	451	Sampson, Alden Mfg. Co.....	388
Bower Roller Bearing Co.....	459	Jeffery-DeWitt Co.	459	Schrader's Son, A., Inc.....	457
Bretz, J. S., Co.....	454	Jeffery, Thomas B., Co.....	458	Selden Motor Vehicle Co.....	463
Briggs-Detroit Co.	458	Johns-Manville, H. W., Co.....	459	Shawmut Tire Co.....	462
Brown-Lipe Gear Chapin Co	468	Jones & Co., Phineas.....	462	Smith, A. O., Co.....	465
Brush Runabout Co.....	388	Jones Speedometer	468	Sparks-Withington Co.	454
Bush Mfg. Co.....	451	K		Speedwell Motor Car Co.....	458
C		Kellom, Chas. F., & Co.....	452	Splittorf, C. F.....	384
Cartercar Co.	458	Kinsey Mfg. Co.....	398	Springfield Metal Body Co.....	452
Champion Ignition Co.....	460	Kissel Motor Car Co.....	458	Standard Roller Bearing Co.....	451
Champion Spark Plug Co.....	451	Kline Motor Car Corp.....	467	Standard Oil Co.....	461
Clark-Carter Automobile Co.....	458	Knox Automobile Co.....	464	Standard Tire Protector Co.	451
Classified Advertising	455	L		Stearns, F. B., Co.....	394-395
Colby Motor Co.....	464	Lauth-Juergens Motor Car Co.....	453	Stewart & Clark Mfg. Co.....	390
Columbia Motor Car Co.....	388	Leather Tire Goods Co.....	451	Stromberg Motor Devices Co.....	385
Continental Motor Mfg. Co.....	452	Locomobile Company	451	Studebaker Corp.	381
Corbin Motor Vehicle Co.....	466	Lovell-McConnell Mfg. Co....	Inside B. C.	T	
Covert Motor Vehicle Co.....	462	M		Thomas, E.-R., Motor Car Co.....	452
Cramp, Wm. & Sons, Ship & Engine		Mais Motor Truck Co.....	463	Timken-Detroit Axle Co.....	391
Building Co.	468	Manhattan Electrical Supply Co...	461	Typhoon Signal Co.....	456
Crosby Company	460	Marion Sales Co.....	464	U	
D		Maxwell-Briscoe Motor Car Co..	388	Union Sales Co.....	463
Dayton Motor Car Co.....	388	Mayo Radiator Co.....	383	United Rim Co.....	462
Dayton Rubber Mfg. Co.....	452	McIntyre, W. H., Co.....	463	U. S. Auto Horn Co.....	462
Dean Electric Co.....	382	Metz, C. H.....	466	United States Motor Co.....	388
Diamond Chain & Mfg. Co.....	468	Michelin Tire Co.....	468	United States Tire Co.....	Inside F. C.-399
Diamond Rubber Co.....	454	Michigan Buggy Co.....	466	V	
E		Michigan Crank Shaft Co.....	451	Velie Motor Vehicle Co.....	454
Electric Welding Products Co.....	465	Miller, Chas. E.....	453	W	
Empire Tire Co.....	464	Mosler, A. R., & Co.....	393	Warner Gear Co.....	468
F		Moss Photo Engraving Co..	461	Warner Instrument Co.....	460
Fedders Mfg. Co.....	398	Motor Car Equipment Co.....	452	Weed Chain Tire Grip Co.....	452
F. I. A. T.....	462	Mott Wheel Works	467	Western Motor Co.....	467
Firestone Tire & Rubber Co.....	465	Motz Tire & Rubber Co.....	451	Wetherill Finished Castings Co.....	467
Fisk Rubber Co.....	383	N		Willys-Garford Sales Co.....	B. C.
Ford Motor Company.....	397	National Motor Vehicle Co.....	458	Willys-Overland Co.	400
G		Nordyke & Marmon.....	458	Winton Motor Car. Co.....	466
Goodyear Tire & Rubber Co	451	Not-A-Crank Gas Engine Starter Co.,	386-387		
Gray & Davis.....	465				



998,635. Armature. Benjamin P. Remy and Frank I. Remy, Anderson, Ind., assignors to Remy Electric Company, Anderson, Ind., a Corporation. Filed Aug. 19, 1909. Serial No. 513,698.

An armature for a magneto formed of a continuous shaft, a core formed of two similar separate parts having an outer segmental portion and inwardly extending shank with the inner end thereof concave to fit on the shaft, a form wound coil through which said shank portion of each part of the core extends, and means for securing the two parts of the core to and on opposite sides of said shaft.

In a wheel of the character described, the combination with a hub spool, comprising in one integral member a peripherally grooved body portion, a pair of spaced, outstanding, annular flanges and a brake-drum spaced from one of said annular flanges, of an elastic cushion surrounding said body portion, an annular ring surrounding said cushion and bearing thereon, spokes, the inner ends of which bear against said ring, a pair of sectional cover plates of such diameter as to overlie said annular ring and a portion of the body of the hub, the inner faces of said cover plates lying in direct contact with these members, bolts passing through the cover plates, said bolts tying said cover plates together, said cover plates having integral, inwardly extending, offset flanges at their inner peripheries, whereby annular recesses are formed at the inner peripheries of said cover plates within which the annular flanges of the hub are received and in which said annular flanges are capable of vertical movement, and means for driving said cover plates from the hub, while permitting vertical movement of the hub with relation to said cover plates.

998,672. Compound Valve. John A. Burleigh, Olean, N. Y. Filed Aug. 2, 1910. Serial No. 575,138.

A compound valve comprising a casing having an inlet port and an exhaust port opposite each other, and delivery pipes leading from opposite sides of the casing between said ports, said casing having one passage communicating with each delivery pipe and disposed toward the inlet and a separate passage communicating with each delivery pipe and disposed toward the exhaust, a turning plug in the casing, having recesses on opposite sides adapted to respectively connect the inlet port and one of the passages to one of the delivery pipes, and the exhaust port and one of the passages to the other delivery pipe, and having a solid part adapted to close the other passages to the respective delivery pipes, and supplemental valves in the casing controlling the passages from the inlet to the delivery pipes.

998,679. Spring Wheel. Joseph B. Dunlap, Tulsa, Okla., assignor of one-eighth to Geo. Ricker, Tulsa, Okla., and Etta L. Ricker. Filed Oct. 24, 1910. Serial No. 588,606.

1. The combination, substantially as herein described, of a wheel proper provided in its rim with spaced radial openings, bolts passing through said openings and having at their outer sides transverse

heads provided with longitudinal openings, pins in said heads and projecting beyond the ends thereof, springs provided at their middles with inwardly projecting lugs lapping alongside the ends of the transverse bolt heads and having openings receiving the projecting ends of the pivot pins in said openings, the opposite ends of the springs being returned and provided with eyes, a spaced rim fitting over the springs and having side plates projecting inwardly beyond and lapping alongside the pivot pins at the middles of the springs, said spaced rim having one of its side plates composed of an inwardly projecting flange and a plate offset to overlap the inner edge of said plate, means securing said overlapping portion to the plate it overlaps and screws connecting the opposite side plates of the spaced rim and extending through the eyes at the ends of the springs and underlying the overlapping offset portion of the spaced rim plate, all substantially as and for the purposes set forth.

998,684. Steering Mechanism for Traction Engines. Edward E. Fee, Rolla, N. D. Filed Mar. 11, 1911. Serial No. 613,723.

1. A steering mechanism of the character described comprising a supporting rod, a second rod pivotally mounted on said supporting rod, spherical rollers rotatably and pivotally mounted upon each end of the latter rod, means yieldingly holding said rollers in alignment, and means for positioning said pivoted rod with relation to the supporting bar.

998,694. Double Shoe Expansion Clutch. Mervin Kessler, Peru, Ind., assignor of one-third to Charles S. Dunn and one-third to Ray Adams, Peru, Ind. Filed Sept. 12, 1910. Serial No. 581,558.

1. In a friction clutch the combination of a shaft carrying a spider having arms arranged in pairs, a shoe formed on the arc of a circle and movably connected to adjacent arms, the arms having slots therein arranged parallel with a line joining the middle points of the arcs of the opposite shoes, pins in the shoes received by the slots, means for holding the shoes inwardly, and means for forcing the shoes outwardly.

998,714. Anti-skidding Dévice for Automobiles. Robert Alexander Moore, Chicago, Ill., assignor to Moore Auto Skid Preventer Company, New York, N. Y., a Corporation of New York. Filed Sept. 27, 1910. Serial No. 584,137.

1. An anti-skidding device for automobiles comprising a support movable toward and from the surface of the ground, and a shoe consisting of a horizontal open frame of somewhat rectangular form, and a plurality of tread members mounted on said frame and arranged parallel with the direction of movement of the shoe in use, the opposite ends of the frame being cut away at their lower edges to expose the lower portions of the tread members.

998,717. Pump System. William K. Read, Texarkana, Tex. Filed Aug. 1, 1910. Serial No. 574,755.

1. The combination with an air compressor and its reservoir, of an internal combustion engine driving the compressor, and having an electric ignition system, a switch interposed in the circuit of the ignition system, and means for starting the engine, said switch and starting means being controlled by the reservoir pressure.

998,725. Driving and Steering Gear for Self-Propelled Vehicles. John C. Van Ors-

del, Youngstown, Ohio. Filed July 19, 1910. Serial No. 572,770.

1. In a self-propelled vehicle, the combination with the axle and steering wheel spindles pivotally connected with the ends of the axle to swing in a horizontal plane for steering the vehicle, of clutches interposed between the axle and steering wheel spindles and each embodying a member movably bodily toward and from the spindles for locking the spindles in aligned position, means for simultaneously releasing both clutches and means for positively swinging the spindles on their pivotal centers for steering.

998,748. Resilient Wheel for Vehicles. Charles Aime Cheretemps, Soisy-sous-Montmorency, France. Filed Jan. 24, 1910. Serial No. 539,786.

1. In a resilient wheel, a stationary rim, metal sockets within said rim open toward one side, helical springs within said sockets, guide members carried by said sockets, cups guided within said members and engaged by said springs to normally force the cups outwardly, balls within said cups, and a movable rim consisting of two symmetrical rings, thin flat rings forming an extension of the rings constituting the movable rim, another ring within which said flat rings can freely move and a wooden ring to which said latter ring is securely adapted to be connected with the spokes to the wheel, substantially as described and for the purpose set forth.

998,753. Tire. George S. Connor, St. Paul, Minn. Filed Feb. 11, 1911. Serial No. 607,922.

A resilient wheel, comprising a felly, a plate mounted on the felly and having an upstanding flange formed on one edge, a ring similar in shape to said flange removably secured to the other edge of the plate, a U-shaped plate of less width than the first plate mounted thereon, means passing through the two plates and the felly for securing the plates in position on the felly, spaced resilient blocks secured between the upstanding portions of the U-shaped plate, a wood ring surrounding the felly but spaced therefrom and resting on the resilient blocks, plates secured to the sides of the ring and extending inward between the upstanding portions of the U-shaped plate and the flange and ring of the other plate, a peripheral cushion member secured to the outer face of said wooden ring, a leather strip covering said cushion member and having its edges extending over the ring and resting on the upper edge of the flange and ring of the base plate, a clamping ring resting on the upper face of the strip on each side, and bolts passing through said ring, the leather and the edges of the flange and ring of the plate for securing the edges of the strip thereto.

998,760. Automobile Lamp Controller. Roy H. Eneix and Ralph W. E. Lowell, Anita, Iowa. Filed Oct. 7, 1910. Serial No. 585,846.

The combination with the frame of an automobile, of lamp supports mounted for oscillation upon said frame, a steering mechanism including a crank arm, a rod extending laterally from said crank arm and having a ball at its free end, a bracket device extending from said frame and having a ball at its free end, a connecting member coupled at one end to said lamp supports and having a socket at its other end for receiving the ball of the lateral arm or the ball of the bracket device, a plate pivoted at one end to said connecting member and forming a closure to the socket

thereof when in one position, and means for locking said plate to said connecting member.

998,764. Drive Gear for Motor Cars. Frank A. Ferguson, Belleville, Kan. Filed June 1, 1910. Serial No. 654,375.

1. A car structure having a tiltable power plant thereon including flywheels, and means for tilting the plant to bring either of the wheels into contact with the surface on which the wheels of the truck are mounted.

998,771. Shock Reducer. Raymond L. Herman and Louis L. Loeb, New York, N. Y. Filed Dec. 9, 1909. Serial No. 532,284.

1. In a shock reducer, the combination with a vehicle having permanently located supporting wheels, of an arm secured to the vehicle, and a lever under tension carried by the arm, and having a wheel at its lower end adapted to be swung from one side of a vertical line to the other side thereof when meeting a depression in the road.

998,779. Rotary Explosive Engine. Charles M. Jordan, Philadelphia, Pa. Filed Dec. 6, 1910. Serial No. 595,975.

1. In a rotary explosive engine, a cylindrical case, a rotary piston within the case, a cylinder head, a cylindrical extension of the cylinder head passing into and acting as a bearing for the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, a piston in the compression chamber, means actuated by the rotary piston for giving reciprocatory motion to the piston in the compression chamber, a head to the compression chamber, an inlet and an outlet port to the compression chamber, substantially as described.

998,785. Lock for Roller Bearing Casings. Charles S. Lockwood, Newark, N. J., assignor to Hyatt Roller Bearing Company, Harrison, N. J., a Corporation of New Jersey. Filed Feb. 13, 1911. Serial No. 608,457.

1. In a roller or ball bearing having a casing in two parts, A and B, with a flange e upon the part A threaded internally and the inner part B fitted adjustably to such thread and provided with a series of radial notches h, the combination, with the said parts, of the locking disk I fitted rotatably in a recess in the periphery of the flange e and provided with the inwardly projecting stud n and the flange having a slot k extended through the bottom of the recess, permitting the movement of the stud, and the stud when turned into engagement with the said notches being in line with the center of the locking-disk.

998,795. Nut Lock. Truman G. Palmer, Chicago, Ill. Filed Aug. 9, 1910. Serial No. 576,354.

1. In a nut lock, the combination with a longitudinally grooved bolt, and a nut thereon, of a locking member swiveled on one of the nut faces and having a protection to take into the bolt groove, and a separate or auxiliary clamping member to hold said projection in said groove, embracing the bolt.

998,796. Nut Lock. Truman G. Palmer, Chicago, Ill. Filed Aug. 9, 1910. Serial No. 576,355.

1. In a nut lock, the combination with a grooved bolt, of a locking member embracing the nut and having an extension directed alongside the projecting threaded portion of the bolt, a projection of said extension

to take into the bolt groove, and means engaged with the thread of the bolt to hold said projection in said groove.

998,800. Stove. Charles P. Quigley, West Mentor, Ohio. Filed Apr. 7, 1910. Serial No. 554,052.

1. The combination with a stove having a fire pot, an ash pit and a flue for the exit of products of combustion, of a hollow burner disposed in the fire pot and communicating with the flue and having its bottom provided with an inwardly directed cone deflector, and a deflector above the cone deflector for co-operation therewith, the burner having openings in its wall between said deflectors to establish communication between the fire pot and the flue.

998,831. Power Transmission Mechanism. John E. Beckman, Chicago, Ill. Filed Aug. 22, 1910. Serial No. 578,317.

1. In a power transmission mechanism, the combination of driving and driven elements, a plurality of different speed gear trains angularly spaced about an axis and each adapted to connect said driving and driven elements, a supporting member carrying said gear trains and journaled to rotate on said axis, a pinion mounted to rotate said member, a gear sector in mesh with said pinion, an operating lever operatively connected with said sector, whereby said supporting member may be shifted to bring different gear trains into position to connect said driving and driven elements, and clutch mechanism for connecting said gear trains with said driving and driven elements.

998,979. Brake for Road Vehicles. James Joseph O'Doherty, Windsor, Victoria, Australia. Filed Nov. 23, 1910. Serial No. 593,846.

1. An improved brake for road vehicles consisting of a brake cup located beneath the nave and having a shank extending through a slotted rigid bracket, a lever brake bar pivoted to said shank, a brake band having one end fastened and passed around the nave and attached to one end of said brake bar, and means for operating the other end of said brake bar.

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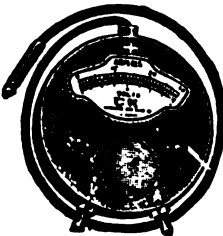
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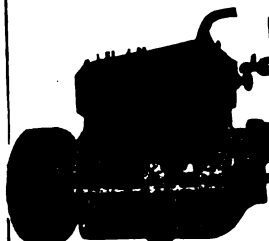
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No. 5

New York, January 25, 1912

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7 Seconds	56 Seconds	24 Seconds	20 Seconds
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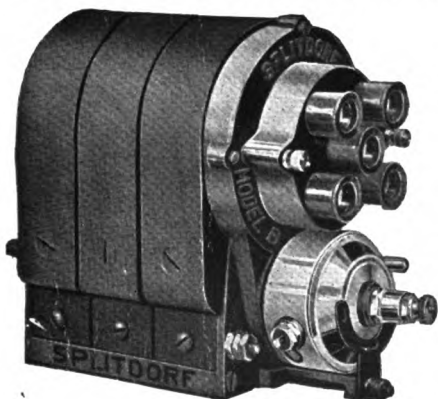
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Chicago Show Forecast

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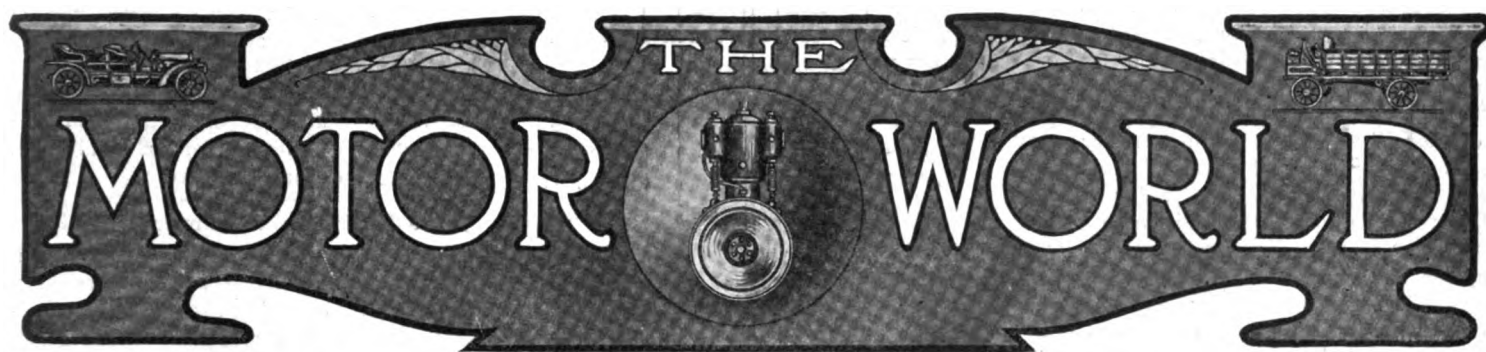
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New York





MAYTAG-MASON OUT OF TROUBLE

Settles With Creditors and Drops "Maytag" from Its Title—Adds Knight Engine Model to Line.

After nearly a year of internal turmoil, during which the creditors applied for the appointment of a receiver, which was refused, which action was followed by a succession of creditors' meetings, the Maytag-Mason Motor Co., of Waterloo, Ia., finally has emerged from its troubles and is again on smooth seas.

The settlement of 33⅓ per cent. which the conferences evolved has been accepted by the creditors, and confirmed by the court, and the company itself has undergone a semi-reorganization, the name Maytag having been dropped from its title. Henceforth it will be known as the Mason Motor Co. New officers also have been elected as follows: President, E. R. Mason; vice-president, H. W. Hayden; secretary and treasurer, W. D. Wallis. The Board of Directors, which was reduced from five to three members, is composed of Messrs. Mason, Hayden and Wallis, and thus is rendered more flexible than under the old order of things.

Mr. Mason was the father of the original Mason company, into which Senator Maytag bought his way some three years since. Mr. Hayden, however, is a new man in Mason affairs. He has been identified with the automobile industry almost from its beginning, for the last six years with the Stoddard-Dayton company, in Dayton, O. One of the results of this association is reflected in the announcement that the Mason Motor Co. now will add a Knight engine model to its line. It is stated that its Knight license gives it exclusive rights of manufacture—not sale—west of the Mississippi river.

The former line of poppet valve models will be continued but their prices will be reduced. They comprise three types of two-cylinder pleasure cars, four models of

four-cylinder cars, and a light delivery wagon.

Griffith Becomes Remy's General Manager.

Harry W. Griffith, of Indianapolis, who has been secretary-treasurer of the Remy Electric Co., of Anderson, Ind., since it was purchased last February by Stoughton A. Fletcher, has been promoted to the general management of the company to fill the vacancy caused by the resignation of W. R. Poland, who has organized the Simplex Manufacturing Co., which will produce an engine starter. Before going to the Remy company, Griffith had a long experience in the manufacturing business, terminating a connection with the American Creosoting Co., of Chicago, in order to assume his new duties.

Case Acquires the Stephenson Truck.

The J. I. Case Co., of Racine, Wis., which last month increased its capital stock to \$40,000,000, is about to engage in the manufacture of motor trucks. Instead of experimenting with a new vehicle, however, it has acquired control of the Stephenson Motor Truck Co., of Milwaukee, and while the trucks will be marketed by the Case company, in conjunction with Case cars, it is stated that the Stephenson plant in Milwaukee will be continued and immensely enlarged.

To Reduce the Duty on Automobiles.

According to the new tariff bill formulated by the Democratic members of the Ways and Means Committee, which strikes heavily into all metal manufactures, the duty on automobiles will be reduced from 45 to 40 per cent. Some of the other things affected are ball and roller bearings from 45 to 25 per cent.; chains, 29 to 20 per cent.; axles and axle parts, 14.81 to 10 per cent.; iron and steel forgings, 30 to 15 per cent.

Bruce Elected Streater's Treasurer.

C. Arthur Bruce, former treasurer of the A. O. Smith Co., of Milwaukee, has been elected treasurer of the Streater Motor Car Co., of Streater, Ill., maker of the Halladay cars. He succeeds A. L. Goetzman.

N. A. A. M. TO APPEAL TO WASHINGTON

Will Ask Interstate Commerce Commission to Order Lower Classification—Concessions Already Obtained.

Every other means having failed, the National Association of Automobile Manufacturers is about to apply to the Interstate Commerce Commission in an endeavor to secure a lower classification of passenger cars than at present exists. The association's traffic committee, which is composed of Albert L. Pope, chairman, L. H. Kittridge and W. A. Innis, is convinced that the present classification is not only unjust and higher than is reasonable, but that it can be shown to be discriminative.

That the railroad authorities are likely to interpose vigorous opposition is indicated by their previous attitude when last year they sought to institute a general increase of all freight rates, which at the time was forbidden by the Interstate Commerce Commission. Following this action of the commission, the N. A. A. M. considered the moment auspicious to renew its efforts to induce the Eastern railroads to rescind an advance made July 1, 1910, in the classification of automobiles, and with that end in view a special conference with the railroad representatives was arranged and occurred in Detroit, at which time the N. A. A. M. fought for the withdrawal of the advanced ratings on passenger cars and a more favorable basis of rating for commercial cars. The net result of the conference was a revision of commercial car ratings, but the railroads were adamant in their refusal to lower their tariff on passenger cars. That the concession gained, however, amounted to something in the matter of dollars and cents, was pointed out by Chairman Pope in his report rendered at the annual meeting of the N. A. A. M. last week:

"Taking as an example," he said, "a shipment from New York to Chicago, the cost of transporting a carload of trucks 10,000

pounds or less will be \$78.00 instead of \$82.50; for a carload weighing 12,000 pounds, \$78.00 instead of \$99.00; for a carload weighing 15,000 pounds, \$97.50 instead of \$123.75, and for one truck weighing 5,000 pounds, \$56.25 instead of \$82.50. Corresponding reductions will apply within the territory east of the Mississippi and north of the Ohio river; the carload rating being reduced from 110 per cent. of first-class, minimum 10,000 pounds, to second class, minimum 12,000; and the less-carload rating from two and one-half times first, minimum weight 2,000 pounds for each machine, to one and one-half times first class, minimum weight 3,000 pounds for each machine."

Chairman Pope also brought out that the minimum carload weight on automobiles in 40-foot cars to California has been reduced from 11,200 to 10,000 pounds, resulting in a saving to the industry of \$36.00 on each 40-foot carload lot, not double decked. Another concession has been secured in the matter of carload shipments to the South, containing extra bodies and other parts, which heretofore have been assessed extra freight charges, the tariff including only automobiles at the carload rate. This has been corrected so that extra axles, bodies, frames, radiators, tops or wheels may be loaded with carload lots of automobiles and charged at the carload rate applying on automobiles, which means that there will be no freight charges on such parts unless the total weight exceeds the minimum weight per car, which is not likely. Arrangements also have been made with the Southern roads to cancel the rule which requires the emptying of gasoline tanks, removal of batteries and the disconnecting of wiring of cars before they will be accepted for shipment.

Goodrich Declares Big Stock Dividend.

The B. F. Goodrich Co., of Akron, O., last week announced the declaration of a 20 per cent. dividend on its \$10,000,000 common stock, payable in preferred stock. A year ago the company created an authorized value of \$10,000,000 7 per cent. cumulative stock, of which 20 per cent. was then distributed to the common shareholders as a bonus and 20 per cent. was sold to them at par, making \$4,000,000 of the new stock then outstanding. The present distribution increases the preferred stock to \$6,000,000. The common stock pays 10 per cent. annually in regular cash dividends, which rate will be maintained. The stock now sells around \$250 a share.

Ohio Cars Get Into South America.

Breisario E. Diaz, of Cartagena, Columbia, South America, who recently was in this country, has secured the Colombia agency for Ohio cars. Diaz has been handling motor boats in Cartagena for some time and believes that when roads now in process of construction are complete there will be a real demand in his country for automobiles.

LONDON TRAFFIC MERGER COMPLETE

Huge Combine to Control All Subway and Bus Lines—Capitalization Over \$82,000,000—Monopoly Feared.

Details of the great London traction merger, which has been in formation for several weeks, just have been announced, showing the stupendousness of the undertaking and proving that the aim of the promoters is nothing more nor less than an absolute monopoly of the entire London passenger service—railroad, omnibus, subway and street cars. That this aim will not be permitted to be accomplished without a hard fight is indicated by the organization of the Premier Motor Omnibus Co., with a capital of \$1,250,000, which is endeavoring to compete with the General Omnibus Co., for the street traffic.

According to the plan formulated for the acquisition of the London General Omnibus Co. by the Underground Electric Railways the proposal is to give for every £100 stock:

(a) £105 of 6 per cent. debentures, redeemable at 125 on or before 1941, and secured on the whole of the undertaking of the Underground Electric Railways and the 'Bus Company.

(b) £105 of 6 per cent. income stock, ranking equally with the present income bonds of the Underground Electric Railways Company.

(c) 100 shares of 1s. each, entitled to one-third of the surplus profits after the income bonds have received their full dividend, with voting power in the event of liquidation equal to that of the ordinary £10 shares of the Underground Electric Railways, and entitled further to one-third of any surplus in a winding up after the income stock has been paid off.

The total capitalization of the merger is about \$82,500,000. It comprises the Underground Electric, controlling companies which carry about 250,000,000 passengers a year, from whom they receive about \$10,000,000 in fares, and the London General Omnibus Company, which likewise receives about \$10,000,000 a year from 200,000,000 passengers.

Kelsey Three-Wheeler to be Restarted.

Undismayed by the failure of the C. W. Kelsey Mfg. Co., of Hartford, Conn., which was petitioned into bankruptcy two months ago, C. W. Kelsey, who organized it, is preparing to make a new start and to continue the manufacture of the Kelsey three-wheel Motorette. Interests which he represents have purchased the assets of the old company and a new corporation is in process of organization. Kelsey states that not only will the manufacture of the gasoline three wheeler be continued but that there will also be brought out an electric-

ally driven motorette, on the equipment for which Thomas A. Edison has been engaged for some time. He adds that when it failed the old company had undelivered orders on its books for 2,559 motorettes and that a contributing cause of embarrassment was its inability to obtain certain vital parts when they were most needed.

Cites Dictionary in Bumper Litigation.

The suit of the J. H. Sager Co., of Rochester, N. Y., against the Emil Grossman Co., of New York City, for alleged infringement of the Sager bumper, covered by patent No. 885,181, of April 1, 1908, was before the United States District Court for the Southern District of New York on Monday last, 22nd inst., on a litigated motion. After the motion was heard the case was placed at the foot of the calendar and probably will not come to trial for several months. In the answer which the Grossman company has filed, nine patents are cited as antedating the Sager patent, but even more unusual is the Grossman claim that the Sager bumper is substantially described in Webster's Dictionary of the issue of 1899.

Poland Gives Up Magnetos For Starters.

W. R. Poland, for several years general manager of the Remy Electric Co., of Anderson, Ind., has resigned that office and disposed of his holdings in the company in order to devote himself to the manufacture and exploitation of the Simplex engine-starter. For the purpose of placing it on the market Mr. Poland has organized the Simplex Manufacturing Co., which will be located in Anderson. The device itself, which is of the mechanical type, will be ready for delivery in quantities early next month. Associated with Poland in the new company are W. S. Poling, G. J. Derthick and James F. Stanley, all of whom are well-known manufacturers in Anderson.

Ohio Car Secures Jewel Buggy Plant.

The Ohio Motor Car Co. and the Jewell Carriage Co., of Cincinnati, which have been closely related, were formally amalgamated on the 15th inst., the chief result of the merger being that the big plant formerly used for the manufacture of Jewel carriages hereafter will be utilized by the Ohio Motor Car Co. exclusively, thus greatly increasing the output of Ohio cars. The business of the Jewell Carriage Co. was disposed of to the American Carriage Co.

Cleveland Truck Seeking Kentucky Site.

The Cleveland Motor Truck Co., of Cleveland, O., is seeking to effect a consolidation with the Howard Motor Car Co., of Galion, Ky., and to remove its plant to the Kentucky town. H. W. Woodward and W. N. Hager, of the Cleveland company have been in Galion and have held several conferences with the Galion people with a view of bringing about consummation of the transaction.

FIGHTING FOR NAME "MERCEDES"

Daimler Accuses New York Repair Company of "Pirating" Trademark—Spurious Parts That Led to Lawsuits.

Having failed to force or induce the Mercedes Repair Co., of New York, to discontinue its use of the name Mercedes, the Daimler Motoren Gesellschaft, the German manufacturer of the Mercedes car, has instituted action in the New York Supreme Court, designed to enforce what it claims to be its exclusive rights to that name.

The complaint recites that the name Mercedes first was registered as a trademark in Germany in 1900, and that when Mercedes cars were shipped into the United States, the Daimler Motoren Gesellschaft secured the American trademark, as applied to motor cars, on September 15, 1903. Despite the fact, in 1906, the Mercedes Repair Co. was organized and incorporated under the laws of New York, to carry on the general sale and repair of automobiles. The Daimler company did not receive the information regarding the new company until several months after the latter had opened an establishment in New York and began using the name Mercedes very conspicuously on its stationery and in its advertisements.

In due course, the parent Daimler company, gave to the Daimler Manufacturing Co., of New York, the exclusive right to sell Mercedes cars in the United States, which right later was transferred to the Daimler Import Co., which, according to the complaint, has at various times demanded that the Mercedes Repair Co. discontinue the use of the name Mercedes and cease the publication of misleading advertisements. As these demands were not acceded to, the suit was instituted.

Among other things the complaint also charges that the Mercedes Repair Co. has been claiming to supply genuine Mercedes parts, which were in fact not genuine, a state of affairs which, it is claimed, has caused the Daimler representatives to become involved in various lawsuits and disputes in which they have suffered both financial and moral damage.

The Daimler Motoren Gesellschaft asks for a permanent injunction forbidding the use of its trade name by the defendants in letterheads, advertisements and otherwise.

New Company to Market Commer Trucks.

Backed by men whose identity has not yet been disclosed, but who are said to be powerful in financial circles, Chester Griswold and H. Walter Webb, who were identified with the Kelly truck in New York, have organized the Transportation Sales Co. in New York and secured the metropolitan sales agency for Commer trucks and Guy Vaughn cars, both of which are pro-

duced by Wyckoff, Church & Patridge. Griswold and Webb, and the interests they represent, are said to have placed an order approximating \$1,000,000 to obtain the agency. They will take over and occupy a large part of the Wyckoff, Church & Patridge building, 1743 Broadway.

Cortland Wagon Shuts Up in Pittsfield.

The Cortland Wagon Co., which only last summer removed from Cortland, N. Y., to Pittsfield, Mass., has closed its plant. The Pittsfield Board of Trade raised \$1,000 to bring the company from Cortland but as additional financial support which was expected has not been forthcoming, the company deemed it wise to stop further loss by ceasing operations. Pittsfield, which is largely a social center in the Berkshire Hills, has been almost a graveyard for automobile enterprises. In rapid succession the Berkshire Automobile Co., the Stilson Motor Co., the Berkshire Motor Car Co., the Jacobson-Brandow Co. and now the Cortland company have been forced to give up the ghost.

Hall Gets Grossman Goods for Canada.

E. A. Hall, formerly of the firm of Hall & Thomas, of Vancouver, B. C., has organized the Hall Motor Supplies Co., in Toronto, Ont., and established salesrooms at 141 King street, East. He will have the exclusive representation of the goods controlled by the Emil Grossman Co., of New York—Red Head spark plugs, Swivelaction bumpers, Vanguard shields, etc.

Decatur Truck May Move to Michigan.

There are excellent prospects that the Decatur Motor Truck Co., of Decatur, Ind., shortly will remove to Grand Rapids, Mich. At any rate, the chamber of commerce in the latter city is seeking to float a block of \$100,000 of the Decatur company's preferred stock, and if the sale is successful, the removal will take place.

Knox Employees Start a Top Factory.

The Reliable Auto Top Co. has been organized in Springfield, Mass., and has secured manufacturing facilities in the building 531 Worthington street. The company is composed of F. Lines, J. McGrath and C. Waldron, all of whom for several years were employed in the upholstery department of the Knox Automobile Co. of Springfield.

To Produce Engine Starters in Milwaukee.

The Auto Supply Co., of 127 Second street, Milwaukee, Wis., is about to place an engine starter on the market. It will be of the acetylene type and will be aggressively pushed.

Progress Truck Coming from Milwaukee.

The Universal Machinery Co., of 1916 St. Paul avenue, Milwaukee, has embarked in truck manufacture. Its production will be styled the "Progress."

MILLIONS IN A STORAGE BATTERY

They Were So Tightly Wedged They Never Came Out—Brokers Sue for Fortune That Eluded Them.

If it goes to trial, the case of Thomas Salisbury Huff and Charles E. Coryell against the Imperial Storage Battery Co., which is on the current calendar of the New York Supreme Court, may throw more than side lights on the causes of the failure of the Imperial storage battery, designed expressly for automobiles, to fulfill the hopes of its sponsors. The complaint itself indicates that their expectations were large, the company having been organized in June, 1910, with \$8,000,000 of that capital stock which is authorized by the liberal laws of Delaware. The stock was equally divided into common and preferred, but only \$800,000 of the common and the same amount of preferred was issued as treasury stock. As preferred stock is useful chiefly for conversion into cash, Charles H. Dickey, president of the Imperial Storage Battery Co., arranged with the complainants, Huff and Coryell, to help dispose of it on a commission basis.

Two agreements were entered into, one on July 7, the other on November 10, 1910. According to the terms of the first one, Huff and Coryell were to sell \$750,000 worth, each, of preferred and common, at not less than par, in return for which they were to obtain 35 per cent. of the gross receipts and the \$50,000 worth of stock which remained in the treasury. Apparently this task proved too tall for the brokers and the second contract was executed whereby they agreed to dispose of \$280,000 preferred and \$280,000 common within six months, while Dickey on his part bound himself to sell to his friends and acquaintances in Baltimore, Md., as much stock as he could possibly dispose of and also to serve as president of the company without salary until May 10, 1911. The new contract also reduced the brokers' reward, they being content with 25 per cent. of the amount of their sales and a bonus of \$20,000 of the preferred and common stock of the company.

Selling stock, even in an \$8,000,000 storage battery company, is not all milk and honey, as the promoters soon discovered. The public refused to buy and as a result, on December 19, 1910, Dickey resigned the presidency of the company, his resignation apparently putting an end to the company's hopes. At any rate, the Imperial battery failed to shed light on the automobile industry. The brokers, however, did not relish the loss of the small fortune which seemed within their grasp. When all else failed, they instituted the present suit against Dickey and the Imperial Storage Battery Co., claiming \$110,000 as the sum due them for their services and which they

would have earned had Dickey carried out the plans.

Dickey, however, tells another story. In his answer to the complaint, he charges that Huff and Coryell represented to him that they had an extensive clientele, fully equipped offices and the necessary organization to carry on a stock selling campaign, and that they possessed sufficient skill to perform all these things satisfactorily. As a matter of fact, however, he claims that they had nothing of the kind—no office force or equipment worthy of the name, and neither clientele, nor skill, nor organization—and that as soon as he found out these things he abandoned the contract on the date of his resignation. He furthermore charges the brokers with misrepresentation of facts in their advertisements of the stock, which, he declares, "were filled with false representations involving the reputation and business standing of the Imperial Storage Battery Co. and himself, its president."

Changes Among Prominent Tradesmen.

E. M. Lubec has been appointed wholesale manager of the Chicago branch of the Studebaker Corporation, succeeding F. M. Busby. The latter has gone with Louis Geyler, the Chicago agent for the Hudson car.

A. D. Caldwell has been appointed district manager for the Hupp Corporation, with headquarters in Cleveland. He will have charge of the R. C. H. and Huppyeats cars in Ohio, western Pennsylvania, Kentucky and West Virginia.

Thomas W. Wilson has been appointed factory manager for the Oakland Motor Car Co., of Pontiac, Mich. He has had 15 years experience in the automobile industry, latterly having served as general superintendent of the Fiat factory at Poughkeepsie, N. Y.

As a result of the resignation of R. A. Palmer as general manager of the Cartercar Co., of Pontiac, Mich., that office has been abolished and henceforth the duties thereof will be more equally divided between two men. Charles A. Trask, as factory manager, will have entire charge of the production end of the business, while Harry R. Radford, the former sales manager, will have his scope enlarged and will take care of everything else.

A. S. Rhoades, who has been identified with the Diamond Rubber Company's branch in San Francisco, has tendered his resignation and early in March will depart to Manila, where he will assume the management of the Bachrach Garage and Taxicab Co., which company handles the Packard, Chalmers, R. C. H. and Buick cars in the Philippines. L. S. Lehoussie, who also was connected with the Diamond establishment in San Francisco, already is en route to Manila, where he will assume the superintendency of the Bachrach taxicab service.

C. P. Townsend, who about a year since resigned the position of Western manager for the Emil Grossman Co., of New York, and joined the Westchester Appliance Co., has returned to the Grossman company and again taken charge of its Western territory. C. A. Mattison is another former Grossman representative who has returned to the Grossman fold and re-assumed charge of the New England States. In the interim Mattison was with the Jacobson-Brandow Co., of Pittsfield, Mass., which failed three weeks ago. L. G. Hartdown, who previously was connected with the Automobile Supply Mfg. Co., and the American Every Ready Co., also has been added to the Grossman staff. He will travel the States of Indiana and Michigan.

Grease Cup Brings Down Indiana Bank.

Although the Matheny Grease Co., which was organized in Terre Haute, Ind., last year, never cut the slightest figure in the automobile industry, it has caused ructions in its native place. It set out to manufacture a patented grease cup for use on automobiles, but, as legal testimony brought out later, it cost \$3 to manufacture the article, the selling price of which had been fixed at \$1.50, the natural result followed and the company went into the hands of a receiver. Fred Goodman, who was a teller in the American State Bank, which was the chief creditor of the grease company, was placed in charge of the latter and endeavored to straighten out its tangled affairs. He signed three unendorsed notes, aggregating \$3,000, which were cashed by the bank of which he was teller; and to further complicate matters, a note for \$6,000, purporting to have been signed by Dr. Frank Tabor, a brother of the bank's president, turned up among the grease company's assets. The mixup is difficult to follow, but charges of embezzlement, forgery and juggling of accounts are flying thick and fast, and the American State Bank has been so seriously affected that, like the grease company, it has been placed in the hands of a receiver.

Holiday Delays an Indiana Suit.

That Sunday is a holiday, but that Labor Day is not Sunday, is the substance of a decision just rendered by the Appellate Division of the Indiana Supreme Court in the appeal of the commissioners of St. Joseph county against the decision of the lower court, in which the commissioners were ordered to refund about \$1,000 in taxes paid by the Tinchier Motor Car Co. The appeal, according to the Indiana law, must be filed within 60 days of the filing of the judgment. The sixtieth day fell on Labor Day, and the counsel for the commissioners waited until the following morning with the filing of the appeal. The judges of the Appellate Division declared that if the sixtieth day had been a Sunday, the delay of one day would have been legal, but that Labor Day was in no sense a "Sun-

day" in the meaning of the law. The appeal was denied and the judgment of the lower court, which was in favor of the automobile company, was upheld.

German Court Upholds the Klaxon Horn.

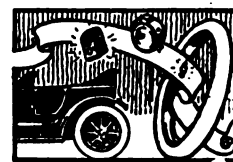
That the Klaxon signaling device properly may be called a "deep-toned horn" is the decision of the Stuttgart Landgericht (Part I), which decision legitimizes the use of the Klaxon in Germany. As is fairly well known, even on this side of the great pond, the regulations in Germany are very strict, and among other things provide that all warning signals must be given by a "deep-toned" horn—the Emperor's car only being excepted. Manufacturers of bulb horns called the attention of the government to the increasing use of Klaxon horns in the Kaiser's domain and declared that this electrical device violated the regulations. The honorable judges of the Stuttgart court before which the case was argued, repaired to the street and demonstrations of the effect and tone of the American horn were given to them, with the result that the court decided that although the horn did have a harsh, grating note, it must be considered "deep-toned" and therefore fully within the provisions of the exacting automobile regulations of Germany.

Thomas Walburn Ends His Own Life.

Thomas Walburn, superintendent of one of the E-M-F factories in Detroit, and well known in Detroit trade circles, committed suicide on Saturday last, 20th inst., by blowing his brains out with a shotgun. For several years he had been afflicted with stomach trouble which was pronounced incurable and which finally forced him to relinquish his position the day before his death. Apparently his depression was so great that he could no longer withstand it. He had made several efforts to end his life, as late as Friday last his wife having caught him in the act and wrested a gun from his hands. He was 46 years of age. Before entering the E-M-F service Walburn was factory manager for the Ford Motor Co., and at one time was with the Bethlehem Steel Co., in Bethlehem, Pa.

Creditors Proceed Against Utah Concern.

A. E. White and A. F. Savage have filed a petition in bankruptcy against The Motor Co., of Salt Lake City, Utah, and asked for the appointment of a receiver. In their petition the two creditors allege that they were employed by J. C. Ross, president of the company, to manage its affairs, and there is due them for these services the sum of \$1,053.60; furthermore that the company owes rental on a building (\$225) and a loan (\$73.06), made by White and Savage. They charge that the company is insolvent and that Ross and Friebe entered into a conspiracy to deprive The Motor Co. of certain funds, for which they ask an accounting.



Denis Egan is building a garage on Cedarhurst avenue, Cedarhurst, N. Y.

Eugene Lowery has purchased the Puente (Cal.) Garage from E. E. Freer.

The Hartford Garage Co., of Hartford, Conn., has filed a certificate of dissolution.

Charles Blake and George Wagner are preparing to erect a garage at Ackley, Ia.

W. E. Kort has opened a garage on South Minnesota street, New Ulm, Minn.

L. G. Kreisle is building a garage and salesroom on North Main street, Victoria, Texas.

K. I. Barr has opened a salesroom in Rapid City, S. D., where he will display Ford cars.

L. W. Brown and F. R. Calvert have opened a garage and repair shop at Rockville, Ind.

A fireproof garage is being erected for W. W. Huffman in Pittsburgh, Pa., at 5221 Atherton avenue.

Johnson & Stephens have opened a garage at Boonville, Mo. They will handle the Studebaker line.

George W. Grundy has opened a garage on the corner of Main and Water streets, Williamstown, Mass.

G. G. Thompson has opened a garage and salesroom in Pembina, N. D. He will deal in Mitchell cars.

Matthew Dapp has purchased a plot of land in Williamsport, Pa., on which to erect a garage and machine shop.

The Kelso Auto Co. has "opened up" in Kelso, Wash. Fred McKenney and Charles Hansickle are the owners of the concern.

The Astoria Garage Co. has "opened up" at Willow and Franklin streets, Astoria, N. Y.; F. A. Simons is president of the concern.

The Owl Garage & Machine Shop has been opened on Palm avenue, Highlands, Cal. Hallet and Dunniway are the owners of the enterprise.

I. S. Pyle has purchased the garage and repair shop of J. E. Parker and E. R. Watkins, of Salina, Kans.; it is located at 144 South Fifth street.

Chester C. Henry has opened an accessory store at 228-230 Halsey street, Newark, N. J. He is State distributor for Stewart speedometers.

L. M. Barton and Leo Ford have formed a partnership under the style the Barton-Ford Motor Car Co., and opened a salesroom in Cedar Rapids, Iowa.

N. D. McIvor has opened a garage at

221 Pacific avenue, Spokane, Wash., where he will display Paterson cars, doing business under the style Commercial Garage.

J. H. Buser has purchased the garage and salesroom of the Adams Auto Co., in Seneca, Kans., and will conduct it under the same style. He handles Buick and Ford cars.

The Abbott Motor Charlotte Co., of Charlotte, N. C., has changed its name to American Motor Car Co. Julian L. Loothis is president and W. Ruffin Smith, secretary.

W. R. Holt, M. E. Cook and Edward Colteaux have purchased the Truax Auto Co., of Mitchell, S. D. They will continue the business under the style Taxi Car Auto Supply Co.

Gehr & Lifquist, who sell automobiles at Wadena, Minn., have found their salesrooms too small and leased the building owned by William Blair and remodeled it into a garage.

The Charles Schiear Motor Co., which operates a garage and salesroom at Evanson, has leased the property at 128 Eighth avenue, Cincinnati, Ohio, where it will open a city salesroom.

F. A. Tuschen has purchased the interest of his brother in the Tuschen Brothers Garage, Watertown, Wis., and will continue the business under the style of the Tuschen Garage.

W. E. Rouse, an undertaker of Pensacola, Fla., has enlarged his undertaking establishment and added automobiles to his embalming business. He has the agency for Stoddard-Dayton cars.

The DeGraff Lumber Co., of DeGraff, Minn., has added automobiles to its stock-in-trade. It makes a specialty of second-hand cars, although it intends to add one or two lines of new cars.

M. A. Griswold and W. E. Anderson have bought the Tropico Garage at Glendale, Cal., from its former owner, W. W. Dutton. They will operate it under the style Tropico Machine Shop & Garage.

A. E. Wood and E. M. Dill have formed the Mitchell-Detroit Sales Co., and opened headquarters at 548 Grand River avenue, Detroit. As the name implies they will sell Mitchell cars exclusively.

William Anderson and W. F. Sickler have formed a partnership and opened a garage at Corona, Cal. They will do general repair work, but expect to add one or two medium priced cars to their business.

The Sioux Falls (S. D.) Auto Supply Co., which has one of the largest accessories

stores in that part of the country, has moved from its old quarters at 114 North Main avenue to its own new building at 232-234 East Tenth street.

The Philadelphia Storage Battery Co. has found it necessary to open a New York branch office to properly take care of the electric vehicle batteries in New York City and vicinity. The branch is located on Columbus Circle, and is in charge of Walter L. Thompson.

Frank Hoffman, one of the partners in the Norton & Hoffman Co., dealers in automobiles and agricultural implements in Holstein, Ia., has sold his interest to his partner, E. E. Norton, who will continue the business under the style Norton Automobile & Implement Co.

The De Lamater-Byrnes Automobile Co. will "open up" this week at 10 West Sixtieth street, New York City, where Hotchkiss and Otto cars will be shown. De Lamater formerly was with the Hotchkiss Import Co., and Byrnes represented Maxwell cars for several years.

Frank J. Edwards has moved into new and more commodious salesrooms at 178 Seventh street, Milwaukee, Wis., in which he will take care of the agency for Kissel pleasure and commercial cars. The new building, is three stories high, of concrete construction, and cost \$70,000.

Charles E. Chadwick, formerly general sales agent of the Chase Motor Truck Co., for the State of Pennsylvania, has resigned his position and formed the Motor Truck Co., of Wilkes-Barre, Pa. He will handle Chase trucks in Northern and Central Pennsylvania, appointing his own agents.

S. N. Harris, president of the Harris Tire Co., Savannah, Ga., has taken the agency for Stevens-Duryea and Hudson cars, and is building a garage and salesroom to handle the automobile part of his business. H. M. Garmany has been appointed manager of the tire business, while Augustus Dimmick, formerly employed in the Hudson factory, has been placed in charge of the automobile sales department.

The Troy Garage Co. has been incorporated in the Alabama city of that name, to take over the supply, repair and storage business of John W. Bowers. The officers of the company are: T. E. Murphree, president; J. W. Bowers, secretary and treasurer, and Charles Copeland, general manager. Bowers retains full control of his salesroom and agencies, this part of the business being conducted separate from the garage.



Iron River, Mich.—Range Motor Co., under Michigan laws, with \$46,000 capital; to deal in automobiles.

Grand Rapids, Mich.—Auto Axle Co., under Michigan laws, with \$24,000 capital; to manufacture axles and other automobile parts.

Watervliet, N. Y.—The Congress Auto Co., under New York laws, to deal in automobiles. Corporators—W. C. Palin, Fred. Steenberg.

Baltimore, Del.—Interstate Automobile Tire and Rubber Co., under Delaware laws, with \$500,000 capital; to manufacture automobile tires.

Davenport, Iowa—B. & B. Auto Co., under Iowa laws, with \$10,000 capital; to deal in automobiles. Corporators—B. E. Brown, H. S. Burnap.

Youngstown, Ohio—Drury-Wells Motor Car Co., under Ohio laws, with \$100,000 capital; to deal in automobiles. Corporators—F. F. Drury and others.

Springfield, Ohio—H. & S. Automobile Co., under Ohio laws, with \$10,000 capital; to deal in automobiles. Corporators—J. W. Hennessey, Joseph Sultsbaugh.

Chicago, Ill.—Pope-Hartford Co., under Illinois laws, with \$20,000 capital; to deal in automobiles. Corporators—James L. Russell, Jessie Shields, E. K. Jones.

Norfolk, Va.—Norfolk Automobile Trade Association, under Virginia laws, with \$2,500 capital. Corporators—T. Gray Couburn, W. S. Broderick, J. C. Waterman.

Seymour, Conn.—Seymour Auto Co., under Connecticut laws, with \$4,000 capital; to deal in automobiles. Corporators—Thomas S. Coleman, Edward F. Coleman.

Des Moines, Iowa—Bernhard-Turner Automobile Co., under Iowa laws, with \$60,000 capital; to deal in automobiles. Corporators—J. C. Bernhard, Jay E. Turner.

Spartansburg, S. C.—R. H. Nesbitt Auto Co., under South Carolina laws, with \$10,000 capital; to do a general automobile business. Corporators—R. H. Nesbitt, W. D. Nesbitt.

Chicago, Ill.—American Auto Supply Co., under Illinois laws, with \$2,500 capital; to deal in automobile accessories. Corporators—Ben Payne, William B. Keefe, William R. Peacock.

Chicago, Ill.—Keystone Garage Co., under Illinois laws, with \$2,500 capital; to do a general garage business. Corporators—Charles C. Loucks, Ephraim H. Atwood, Burrell J. Kramer.

Hoboken, N. J.—Hudson Motor and Garage Co., under New Jersey laws, with \$50,000 capital; to do a general automobile

business. Corporators—C. C. Moller, R. W. Fulcher, M. Moller.

Richmond, Va.—Oakland Auto Co., under Virginia laws, with \$15,000 capital; to deal in automobiles. Corporators—R. H. Bruce, Chester, Va.; S. V. Gregory, G. T. Sharp, of Richmond.

Chicago, Ill.—Union Club Motor Livery, under Illinois laws, with \$1,000 capital; to do a general delivery and motor business. Corporators—Abram L. Myers, E. A. Zimmerman, E. L. Wellner.

Chicago, Ill.—Rene Safety Auto Wheel Co., under Illinois laws, with \$50,000 capital; to manufacture automobile wheels. Corporators—John A. Yotte, Charles F. McKay, Jerome E. Evans.

Wyndmere, N. D.—Wyndmere Auto & Machine Co., under North Dakota laws, with \$10,000 capital; to deal in automobiles and supplies. Corporators—E. E. Leinan, L. E. Leinan, T. B. Aasland.

Buffalo, N. Y.—Centaur Manufacturing Co., Inc., under New York laws, with \$35,000 capital; to manufacture automobile accessories. Corporators—A. Schmidt, Bertha F. Schmidt, J. E. Barry.

Rock Island, Ill.—Horst & Strieter Co., under Illinois laws, with \$10,000 capital; to manufacture and deal in motor vehicles and supplies. Corporators—Henry W. Horst, Henry T. Horst, Martin E. Strieter.

St. Louis, Mo.—Missouri Auto Top and Supply Co., under Missouri laws, with \$2,000 capital; to deal in automobile supplies. Corporators—Ben W. Dalzell, William Brennecke, Wilbur C. Schwartz.

Columbus, Ohio—Star Vulcanizer Mfg. Co., under Ohio laws, to manufacture automobile tire vulcanizers and other accessories. Corporators—David F. Detrick, W. L. Fox, Nelson J. Fountain, Elizabeth Fox and Alice Fountain.

Bicknell, Ind.—Bicknell Auto Co., under Indiana laws, with \$15,000 capital; to deal in automobiles. Corporators—E. T. Hollingsworth, J. E. Keith, S. S. Hollingsworth, H. A. Murray, John Carrico, Robert McClure, W. V. Gates.

E. Dover, Del.—Randolph Motor Truck Co. of Delaware, under Delaware laws, with \$200,000 capital; to manufacture motor trucks. Corporators—H. O. Coughlan, Brooklyn, N. Y.; W. W. Bender, New York City; J. M. Satterfield, Dover, Del.

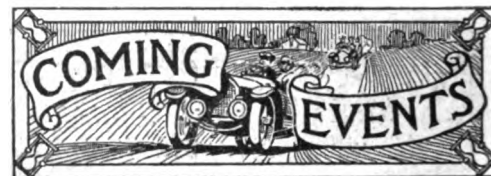
Recent Losses by Fire.

Hoboken, N. J.—Ross Repair Co.'s garage at 209 Thirteenth street, and two cars destroyed. Loss, \$5,000.

Brooklyn, N. Y.—Bedford-Bergen Automobile Exchange, 33 Grant Square, destroyed and six cars burned. Loss, \$50,000.

Providence, R. I.—Capitol Motor Car Co. and Tilden-Thurber Co., 65-67 Fountain street, badly damaged by fire and water.

Yonkers, N. Y.—Yonkers Automobile Station, 71-73 South Broadway, and nine cars destroyed. Loss to building, \$15,000.



January 13-27, Philadelphia, Pa.—Philadelphia Automobile Trade Association's annual show in First and Third Regiment Armories.

January 22-27, Providence, R. I.—Rhode Island Licensed Automobile Dealers' Association's show in the State Armory.

January 22-27, Rochester, N. Y.—Rochester Automobile Dealers' show in State Armory.

January 22-29, Detroit, Mich.—Detroit Automobile Dealers' Association's annual show in Wayne Garden.

January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

January 29-February 3, Scranton, Pa.—Second annual automobile show in 13th Regiment Armory.

February 1-7, Washington, D. C.—Annual show in Convention Hall.

February 3-10, Montreal, Can.—Automobile Club of Canada's annual show at Drill Hall.

February 3-10, Harrisburg, Pa.—Harrisburg Automobile Dealers' Association's third annual show in Harrisburg Arena.

February 5-10, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of commercial vehicles.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

February 5-17, St. Louis, Mo.—Annual show in the Coliseum.

February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.



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NEW YORK, JANUARY 25, 1912.

MISCONCEIVED NOTIONS OF "VALVELESSNESS."

Since the sleeve-valve motor attained prominence and established the fact that the gasoline engine is not dependent for its successful operation upon the poppet valve, patent office records and trade publications have been filled with descriptions of motors embodying various forms of sleeve valves, rotary valves, slide valves, disk valves—all kinds other than poppet valves. In some way, however, the idea seems to have become prevalent that a motor without poppet valves is a "valveless" motor, and this term is very commonly applied to motors that are no more valveless than the conventional poppet valve engine.

A profound knowledge of the science of mechanical engineering is not essential to an understanding of the fact that a valve is none the less a valve because it rotates instead of rising and falling, or because it is in the form of a cylinder or a disk instead of a mushroom, and that a motor is not "valveless" when it has valves, even though they are different in form and in operation from the familiar poppet; and to appreciate the fact that most of these so-called "valveless" motors are not what the term implies.

As a matter of fact, there is not and cannot be a truly valveless gasoline motor, as gasoline motors now are built, for the means for admitting and releasing the gases, no matter what form such means may take, constitute valves. The nearest approach to valvelessness in a gasoline engine is the simplest form of two-stroke cycle three-port motor; but even in this the piston and cylinder act as a valve, in addition to performing their primary functions. This type of motor, however, is usually considered valveless because it has no valves that are valves only, and nothing else.

It is probable that the misuse of the term "valveless" has become common largely because of the lack of technical information among those who have to do with the handling and the use of motor cars, and partly because it is a very easy matter to form the habit of using words loosely and without regard for their true meaning. In which connection, it is worthy of remark that manufacturers who build sleeve-valve motors do not refer to their motors as "valveless" but as "sleeve-valve" engines, which is of course just what they are.

THE ELECTRIC VEHICLE AS AN "INVADER."

If anything is more remarkable than the increased interest in electric vehicles that has marked the past twelve-month, it is the number of new cars that have entered the field and the refreshing quota of new ideas which even some of the late comers have brought with them. They serve to refute the contention that the electric vehicle had become stagnant—that it early reached a point beyond which substantial improvement or innovation was impossible.

These innovations serve to give added force to the electric movement and cannot fail to make converts; for there is an appeal in the electric car that is not to be denied. After one has been surfeited with speed, after all the roads within a day's radius have become staled, after one has wearied of the caprices and dissatisfactions of chauffeurs and garages, to employ a colloquialism, there is no gainsaying that the electric car begins to "look good" even to some of those who have made use of gasoline cars, while to womankind and to many men of certain callings or professions it appeals regardless of such considerations and because of its particular virtues or advantages.

It no longer is fair to view the electric askant or to minimize its position in the industry. It is becoming a real factor in the trade and regaining much of that importance which it enjoyed when automobiles were really young. It may never seriously challenge the gasoline car but it no longer must be overlooked.

It is only when a true electric enthusiast and advocate is encountered that a measure of its importance is obtained. Suggest to him that the electric vehicle—either passenger or freight—is invading the realm of the gasoline car and he will retort that it is the gasoline vehicle that has invaded the electric's field. He will earnestly insist that the city and its suburbs belonged and belong to the electric and that the gas car is there only on sufferance and because of sheer weight of numbers; that it has no real place in the affairs or usages of a city—that its uses therein are purely artificial and if he fails to carry conviction that the electric now is "beating back the invader" and "coming into its own" again, the enthusiastic advocate can uncover angles to the electric situation that often are unthought of but that nevertheless are entitled to serious consideration.

Properly exploited, there is money in the electric vehicle for almost any dealer, and satisfaction in its use.

Well may it be asked, Where are the reds of yesteryear? Those "fire alarm" reds that suggested rum, riot and devilishness or general bedevilment and that made police and populace "sit up and take notice." Their disappearance—their almost entire absence from the shows is not short of remarkable. Not very many will be sorry to see them go. Though they may have imparted a glow to the landscape, their going is a good sign. Flaming red vehicles rightly belong only to circuses.

WESTINGHOUSE'S DEVICE READY

Air-Brake Inventor's Long Promised "Revolutionizer" Proves to be Shock-Absorber—Idea Ingeniously Executed.

Though it has been known for several years that George Westinghouse, whose name and fame are interwoven with the air-brake and electrical goods which bear his name, has been actively engaged in the development of an air spring, up to the present time little has been disclosed concerning it. Which probably accounts for the popular notion that it is some form of spring wheel, and that it is calculated at least to put the pneumatic tire out of business. But it transpires that such is not the case.

It is an air spring which is designed to act as a shock absorber or in an auxiliary capacity to the ordinary springs on a car. In its simplest aspect it is merely a steel cylinder closed at both ends and enclosing a movable piston. By means of suitable brackets the piston attaches to the frame of the car and the cylinder is attached to the outer end of a spring, the device thus serving as a flexible connection between the spring and the frame of the car. Actually, the device is much more than a plain cylinder and piston, of course, and in the method of equalizing the air pressure above and below the piston is reflected some of the genius for which Westinghouse has become famous. Four of the air springs constitute a set, two for the front of the car and two for the rear, and it is claimed that they will so ease the action of a car on rough roads as to effect a sufficient saving in car depreciation and tire wear to pay for them in a season's use.

Though Westinghouse is financing the production of the air springs their manufacture is totally divorced from the other Westinghouse interests and is largely in the nature of a private enterprise. They are being manufactured in Derby, Conn., by the United States Rapid-Fire Gun and Power Co. It is expected that they will be ready for the market within a few weeks.

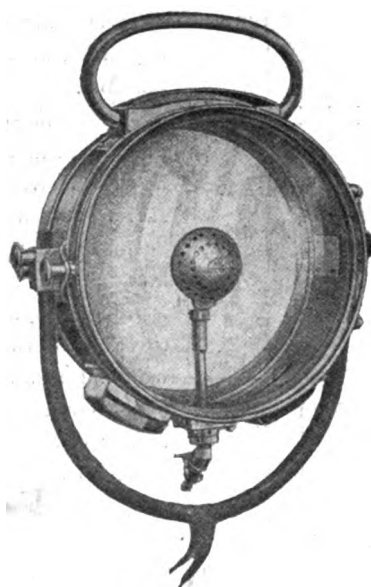
St. Louis Tries to Stop "Bribery."

With the avowed intention of eradicating the "commission" system among chauffeurs and garage owners, the executive committees of the St. Louis Automobile Manufacturers' and Dealers' Association, the Motor Accessories Association, the Automobile Club of St. Louis, and the Auto Drivers' Association held a meeting last week and strongly condemned the practice. It was decided to publish the names of any firm giving "bribes" to chauffeurs, after 60 days grace had been extended to the offending dealer in which to show "reform." One of the peculiar phases of the situation was brought out by the drivers' committee who

stated that certain employers have ordered their chauffeurs to secure the commissions or bribes and to turn them over to the employer.

Zeiss's Solution of Headlight Problem.

The problem of dimming the glaring rays of headlights while passing through cities and towns has been attacked by many manufacturers of lamps from various angles, and as a result there are a number of patented and unpatented devices on the market, including the shifting of the center of the light out of the focus of the reflector, by sidewise movement; the use of a separate small lamp outside of the focal axis; the fixing of a sort of Venetian blind in front of the glass which causes the full strength



of the light rays to fall directly in front of the car, but prevents them from penetrating to any distance, the whitewashing of the glass, and many other means to the same end. The most radical and seemingly the simplest device of this sort, however, just has been brought out by Carl Zeiss, the famous optician and lense maker of Jena, Germany.

In the Zeiss headlight, which is shown in the accompanying illustration, the burner is revolvably mounted on a tubular pillar, and fitted with a small parabolic mirror. When the full force of the headlight is desired, the rays of the burner are reflected from the small parabolic mirror into the large reflector at the back of the lamp, being greatly intensified by this simple means. The illustration shows the headlight as it is used in the open country. When it is desired to dim the radiance of the lamp, a half turn of the burner places the small mirror in back of the flame, allowing the rays to escape without being intensified by the large reflector, and giving just enough of a light to give warning of the approach of a car. Although the illustration shows only a gas headlight thus fitted, the device also is applicable to electric lamps.

ELECTRIC WITH TWO-SPEED GEAR

Church-Field Car Incorporates a Revolutionary Feature—Also Several Others That Are Radical Departures.

Radical in many other features, the Church-Field electric car which just has been placed on the market by the Church-Field Motor Co., of Sibley, Mich., almost is revolutionary in one respect; it employs a two-speed change gear mechanism. As this is the first time an electric car has been so equipped it really marks a distinct era in the building of electric vehicles.

The change-gear mechanism is of the planetary type and by its combination with a specially wound motor which it is claimed is capable of delivering 75 to 100 per cent. greater power than the ordinary motor the manufacturers have aimed to place their product on a more even footing with its gasoline propelled cousins by increasing its hill-climbing ability and decreasing the current consumption; consequently the touring radius has been increased proportionately.

Another of the unusual features of this altogether unusual car lies in the use of a controller which provides no less than 10 speeds instead of the five or six which ordinarily are provided. The controller is conveniently located on top of the steering wheel. The car is low-hung and thus presents a pleasing appearance, the effect being obtained by suspending the frame below the axles. But even in the spring suspension the arrangement is unusual in that semi-elliptic springs are used in front, while those in the rear are full-elliptic members. By reason of an exceptionally long wheel-base bodies are more than ordinarily spacious and are finished and fitted out in a manner that becomes the product of a first-class manufacturer. Several body styles are listed, including the ever-popular coupes and enclosed cars and the line is further rounded out by the inclusion of an open type of roadster which suggests not a little the low-hung racy style of gasoline car.

Cadillac Machine Guns for Guatemala.

Three motor cars fitted with Colt machine guns are to be added to the "army" of Guatemala—evidently for the purpose of starting another rumpus in Central America. Guatemala figures that the possession of the three machine-gun-automobiles should give it a decided advantage over the several other republics north of the Panama Canal zone, and the betting odds are in its favor at present. The cars were built at the Cadillac factory on 1912 chassis and in addition to guns, were fitted with complete wireless telegraph outfits. They are of the same pattern as those used by the Northwestern Military Academy during the past two years in its annual vacation maneuvers.

GOOD-BYE TO "GOOD OLD GARDEN"

Record-Breaking Attendance Marks Last Show in Famous Building—Big Business in Trucks During Closing Days.

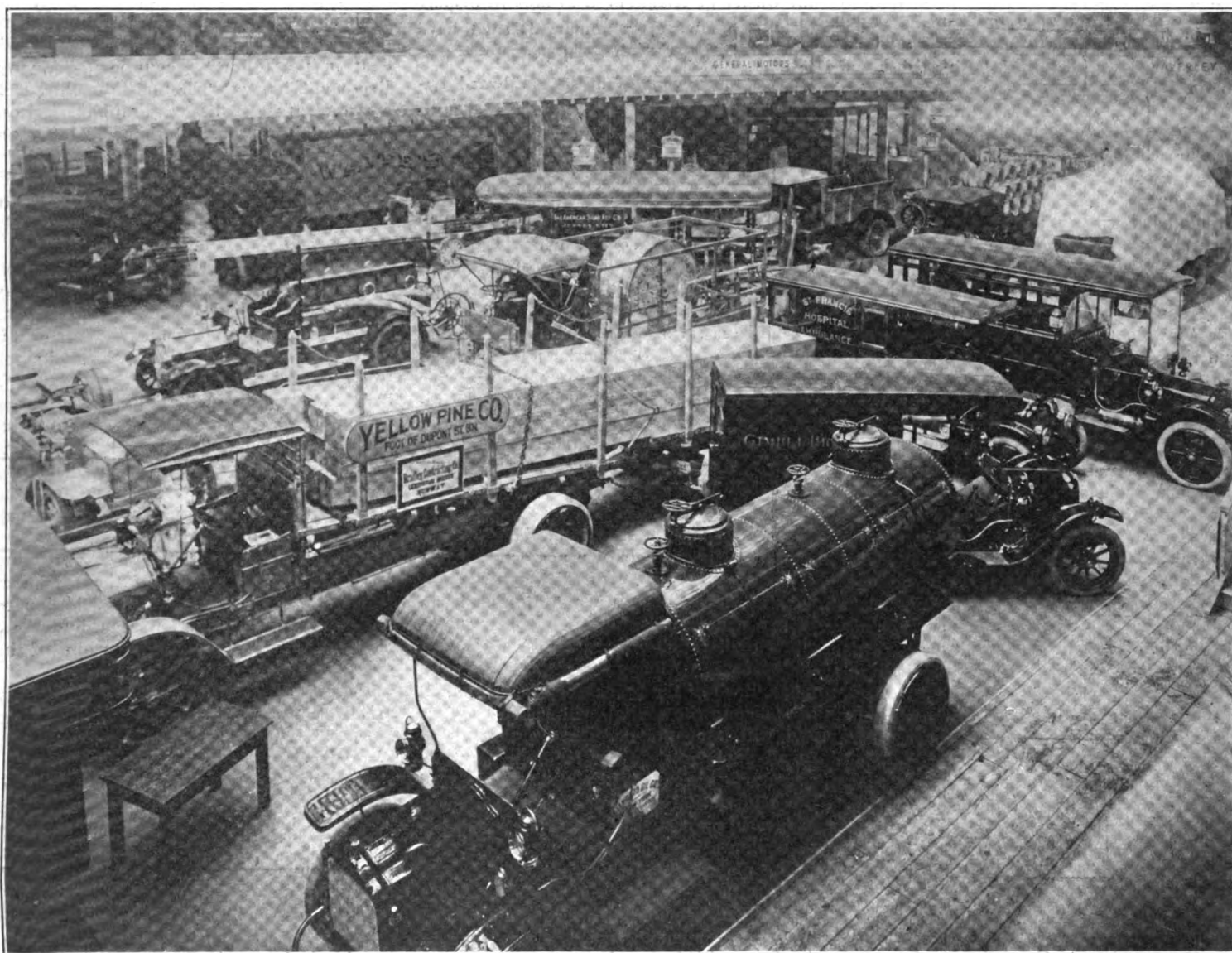
Apart from the extraneous item of decorations, if the last automobile show in Madison Square Garden was not the best one, then signs have lost much of their meaning. Certainly it clearly demonstrated

when ingress and progress and egress was more difficult. The crowds during both afternoons and evenings were positively uncomfortable.

Whether in point of sales the first week was as fruitful as during former years is a moot question which none can answer satisfactorily. Most of the indications point to a negative reply; but that the results of the show fairly cannot be measured by the sales made during its tenure is proven by the experience of a single Brooklyn dealer

inative would dare risk an estimate of the total. The exhibitor, one of the oldest truck makers in the field, who sold but two vehicles at the 1911 show and who booked 17 orders last week, may be cited as a good example of the comparative results.

If there was any disappointment growing out of the truck display it was confined almost wholly to the accessory exhibitors; but there was less of it than was the case last year when "truck week" first was established, for the simple reason that there



LAST GLIMPSE OF TRUCKS IN GOOD-BYE SHOW IN MADISON SQUARE GARDEN

that public interest in automobiles and automobile shows has abated not a jot.

As late as yesterday, it was stated at the Board of Trade office that the count of the attendance and the box office receipts was not available so that the exact figures are not obtainable; but that the attendance during the first week when the pleasure cars were staged, reached record-breaking proportions there is small doubt. Approximately, there were 140,000 admissions the first week.

Never were the weather conditions more unfavorable and yet there was never a show

who informs the Motor World that he closed ten bona fide sales on Sunday, the day after the show closed.

If there is doubt as to the volume of business done during the first week of the exhibition in the Garden, there is none regarding the second week—"truck week"—which ended Saturday night last. All reports agree that "there was business doing all the while," and that the commercial vehicle exhibitor who did not depart uncommonly well satisfied was the exception and not the rule. The sales made ran into big money, but none but the highly imag-

were fewer exhibitors of such wares. In 1911, the accessory men were a glum crowd. Many of them had no real license there. They "sat out" the two weeks chiefly because some rival had elected to do so and disappointment was their portion.

Not so many of them repeated the folly this year; they profited by their experience. Others failed to do so and again they had more time than anything else on their hands. It is a fairly safe wager that no accessory manufacturer will grow rich from the volume of business he books during a truck show. Those who attend have eyes

for and thoughts of trucks only; they are little concerned with their parts, or with separate articles of equipment unless it be tires.

Whether the attendance during the second week was as great as during the corresponding period of last year is another open question which only the official figures can decide; it would excite no surprise if they showed a falling off. For in 1911, the trucks appeared to be viewed largely as curiosities and women and children flocked in considerable numbers, much as they flock to circuses or "zoos." "Truck week" was a serious week—almost strictly a business week, as it was designed to be.

During the past three months and ever since it was announced that Madison Square Garden would be demolished to make room for a sky-scraping office building, periodical reports have been printed and widely circulated that one thing or another had occurred to postpone the day for from one to five years. Within the past three weeks such reports have redoubled and have made it appear that the last automobile show in the Garden had not occurred, and that 1913 might witness another under the famous arched roof.

But all such reports are likely to prove false alarms. Men who have been associated for years with the Garden management would not have betaken themselves elsewhere had such likelihood been great, nor would the Automobile Board of Trade have secured the lease of the new Grand Central Palace if hope remained that Madison Square Garden might again be utilized. Only recently the State authorities even revoked the license of a so-called sporting club when it could not produce a year's lease of the Garden such as the law requires of such clubs.

It is quite certain that the automobile trade has bid a last goodbye to the Garden, which has served its purpose so long and so well. Hereafter the trade's footsteps will trend toward the new Grand Central Palace and its annex, which will be erected during the approaching twelve-month, and which will permit of the one great show so greatly to be desired.

Where They Use Whiskey in Radiators.

Using whiskey in the radiator of an automobile—shades of Kentucky colonels! But it actually is being done in some parts of Canada—if a Canadian story which comes by way of Seattle can be trusted. It seems that whiskey—or something that bears the name of whiskey—is pretty cheap in Canada, retailing at \$1.50 a gallon, while alcohol costs \$2 a gallon; and as the thermometer frequently reaches 30 degrees "below" it is of course necessary to prevent the water in radiators from freezing. Alcohol is in plentiful use elsewhere for that purpose, but in some parts of Canada the \$1.50 whiskey is used instead and serves the purpose just as well.

NO EXCUSE LEFT FOR NEW YORKERS

Secretary of State So Notifies Police Authorities—No Delay on His Part—How Numbers Have Been Allotted.

Unlike last year there has been no delay in supplying New York automobile owners with their 1912 registration plates, and chauffeurs with their license badges. They have been ready since October 26th last, and the owner or chauffeur who fails to display his 1912 number after January 31st will have himself to blame and need expect no leniency in the event of arrest. Edward Lazansky, the Secretary of State, has so notified the chief of police or the other police authorities in all the cities of the State, adding that as everyone has had an opportunity to comply with the law, no fault can now attach to his office, which last year did not complete the delivery of tags until long after the legal period for so doing had passed.

In his notification to the police, Secretary Lazansky also remarks that many of the renewal notices sent to chauffeurs have been returned to him on account of the removal of the chauffeurs from the addresses given when they made their 1911 applications. As the secretary's office has no means of locating them, Mr. Lazansky states that in event of arrest they will have no good excuse, as their apprehension will be due solely to their own neglect.

Due to the opening of fully qualified offices in New York City and Buffalo it no longer will be necessary for applicants for either registration or licenses to send the required fees to Albany for the "papers" and tags. Each of the branch offices, as well as the office in the capital, will accept the fees and will issue the necessary authorization to all applicants. To facilitate matters, Secretary Lazansky has also apportioned the registration tags and the chauffeurs badges in parcels that will serve somewhat to facilitate identification.

The plates issued this year are made of steel with a bright red fused porcelain enamel background and white numbers and letters. The badge issued is one inch in diameter with bronzed metal letters about the rim at the top "licensed chauffeur," and at the bottom, "New York 1912;" across the middle are the numbers of the chauffeur and above and below the numbers and between the letters aforesaid, bright red enamel.

Number plates numbers 3,000 to 49,999, both inclusive, and chauffeurs badges numbers 1 to 24,999, both inclusive, are being distributed from the New York City office to owners and chauffeurs respectively resident in the following counties: New York, Kings, Queens, Richmond, Nassau, Suffolk, Westchester, Rockland and Putnam.

Number plates numbers 50,000 to 69,999,

both inclusive, and chauffeurs' badges numbers 25,000 to 29,999, both inclusive, are being distributed from the Buffalo office to owners and chauffeurs respectively resident in the following counties: Alleghany, Cattaraugus, Cayuga, Chautauqua, Chemung, Cortland, Erie, Genesee, Livingston, Monroe, Niagara, Onondaga, Ontario, Orleans, Schuyler, Seneca, Steuben, Tioga, Tompkins, Wayne, Wyoming and Yates.

Number plates numbers 70,000 to 85,000, both inclusive, and chauffeurs' badges numbers 30,000 to 35,000, both inclusive, are being distributed from the Albany office to owners and chauffeurs respectively resident in the following counties: Albany, Broome, Chenango, Clinton, Columbia, Delaware, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Herkimer, Jefferson, Lewis, Madison, Montgomery, Oneida, Orange, Oswego, Otsego, Rensselaer, St. Lawrence, Saratoga, Schenectady, Schoharie, Sullivan, Ulster, Warren and Washington.

Information concerning a particular number plate or chauffeur's badge number may be obtained from the office where it was issued. If the name of an owner or chauffeur be only known, then information as to the number of the plate or chauffeur's badge may be obtained at any of the offices.

Number plates numbers 1 to 999, both inclusive, are being distributed to persons especially requesting such low numbers, and are more or less scattered throughout the State. Information concerning these may be had at any of the offices.

Number plates 1,000 to 2,999, are being issued to dealers. Each of these number plates bears the letter "M" in addition to the numeral. Information regarding these numbers may be obtained from any of the offices above mentioned.

There will also be issued as necessity arises, as in a case where an owner has lost his number plates, number plates numbers 01 to 0500 for temporary use until duplicates of the lost numbers can be furnished. Information concerning numbers from 01 to 0250 inclusive, may be obtained at the New York office; from 0251 to 0350 inclusive at the Albany office; from 0351 to 0500 inclusive at the Buffalo office.

There also will be issued as necessity arises in the case where a chauffeur has lost his badge, badges 01 to 0100 inclusive for temporary use until duplicate badge can be furnished. Information concerning badges from 01 to 050 inclusive may be obtained at the New York office; from 051 to 075 inclusive at the Albany office; from 076 to 0100 inclusive at the Buffalo office.

No Races at Syracuse State Fair.

Prompted by the deplorable accident which occurred last year at the races held during the annual State Fair at Syracuse, N. Y., the New York State Commission has issued an order prohibiting the racing of automobiles on the present dangerous dirt track.

TRUCKS IN PHILADELPHIA ARMORIES

Replace Pleasure Cars for Second Week of Quaker Show—Three That Were Not Seen in New York.

"Nothing to do till to-morrow," was by no means a popular quotation with the motor car exhibitors when the band played "Home, Sweet Home" shortly after 11 o'clock on Saturday night last, 20th inst., at the close of Part I of the eleventh annual Automobile Show of the Philadelphia Automobile Trade Association in the First

maining commercial vehicles in the Third Regiment Armory.

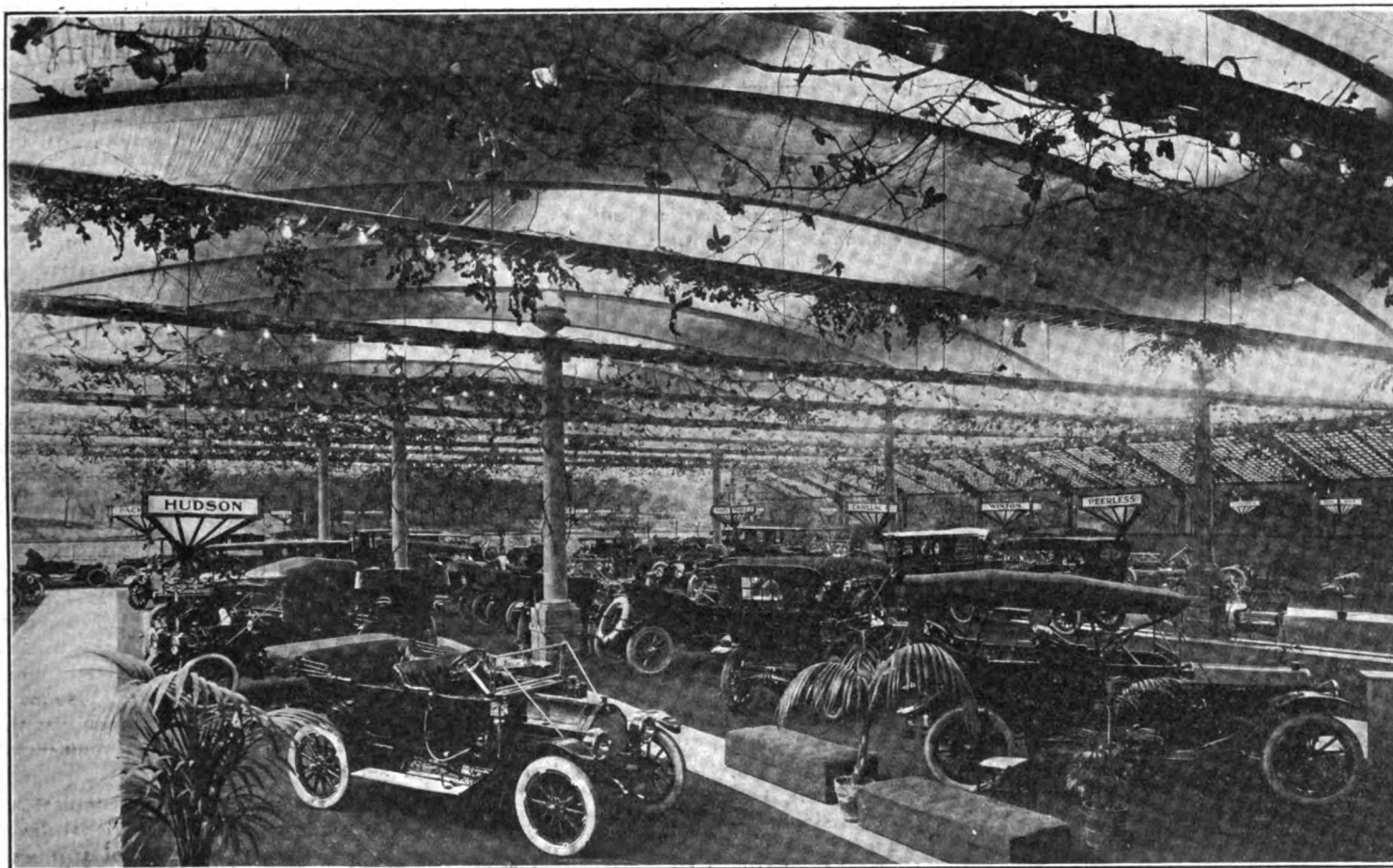
Four makes of commercial cars which were not shown in New York, made their appearance, one of which, the Philadelphia truck, exhibited by the Philadelphia Truck Co., is new on the show circuit. The new comer is of 1,500 pounds capacity, and mounts a 25-horsepower motor, and is distinguished by an electric engine-starter and complete electric lighting equipment. The other three trucks not seen at either of the New York shows are the Seitz, Cartercar, and Mercury.

The exhibitors and their products are as follows: Chase Motor Truck Co., Chase;

DONALDSON NEW HEAD OF S. A. E.

With Other New Officials, He Assumes Office at Annual Meeting—Banquet Concludes Three Days' Session.

In accordance with the slate prepared by the nominating committee and following the count of the mail vote, Henry F. Donaldson, of New York, was formally declared president of the Society of Automobile Engineers on Thursday last, 18th inst. Following President Souther's address and a number of other business matters includ-



DECORATIVE SCHEME OF THE PHILADELPHIA SHOW, CARRIED OVER INTO "TRUCK WEEK"

and Third Regiment Armories. Indeed, in order to make room for the 20 commercial vehicles and the eight electric pleasure car exhibits which hold the boards until Saturday next, 27th inst., most of the pleasure car exhibits were removed either late Saturday night or during the early hours of the following Sunday morning. The decorations, however, remain unchanged, as well as most of the accessory exhibits.

The "Truck Show," as Part II is termed, developed so greatly since it was instituted two years ago, that on the present occasion instead of being confined to one armory as previously was the practice, both buildings are used, 13 different trucks and the full complement of electrics being staged in the First Regiment Armory, and the re-

Commercial Truck Co., of America, Commercial; United Motor Philadelphia Co., Sampson; Foss-Hughes Co., Pierce-Arrow; Longstreth Motor Car Co., Alco; North Philadelphia Automobile Station, Knox and Martin; Packard Motor Car Co., of Philadelphia, Packard; E. C. Johnson Co., Reo; Philadelphia Truck Co., Philadelphia; Baker-Bell Motor Co., Seitz; Autocar Co., Autocar; General Motors Truck Co., G. M. C.; Cartercar Co., Cartercar; Continental Motor Car Co., Speedwell; Franco Motor Truck Co., Mercury; Gramm Motor Truck Co., Gramm; Auto Equipment Co., Flanders; General Motor Car Co., Rauch & Lang; Carrol A. Haines & Co., Baker; Hupp Corporation, Hupp-Yeats; Seltzer & McCowen, Columbus.

ing the reading of the treasurer's report, the result of the election of officers was announced on Thursday, which was the first of the three days' session which was held in Madison Square Garden.

Without exception, all the other nominees and members of the council which originally were slated were declared elected, the remainder of the list being as follows: First vice-president—H. W. Alden, Timken-Detroit Axle Co.; second vice-president—Harold L. Pope, Pope Mfg. Co.; treasurer—Herman F. Cuntz, Automobile Board of Trade; members of the council—A. L. Riker, Locomobile Co., of America; Charles B. Whittelsey, Hartford Rubber Works; A. B. Cummer, Autocar Co.; Henry Souther. Approximately 250 members were on

hand at 10 o'clock on Thursday morning when President Souther rapped for order and delivered his opening address in the course of which he brought many enlightening facts with reference to the progress which has been made in the last year and the aims of the Society for the future. One of the most interesting things he mentioned and one which probably will prove surprising to those who have not kept careful trace of the wonderful growth of the Society during the past two years, was that since June, 1910, the membership has been quadrupled. "In June, 1910," he said, "we had 310 members; in January, 1911, we had 614; in June, 1911, we had 899, and at the present time we have a membership of 1,200."

In connection with this phenomenal growth he remarked that there has been some comment to the effect that the Society is increasing its membership too rapidly and admitting every one promiscuously, and added that probably those who hold this view do not fully appreciate the work which is being undertaken by the Society. "Possibly the name of the Society is misleading in this respect; that is, that it is a society of automobile engineers pure and simple," he said. "The term 'engineer' strictly interpreted means one who has been educated in an engineering school or who has acquired engineering knowledge by experience. To draw a line strictly between one who qualifies in this respect and one who does not, is no easy matter, and I believe, for one, that such division is not necessary."

"What this society is seeking is results which will increase the engineering knowledge useful to the members, and which will help the industry as a whole; therefore, if a man is qualified to help forward any of the numerous branches of our work, then he is qualified for membership in the Society. This statement always assumes that the Society is going into a broad and practical field of work, and will not limit itself to a strictly theoretical field. If the Society of Automobile Engineers hopes to do as much for its industry as the Master Car Builders Association did for the railroad industry, then the membership cannot be confined strictly to simon-pure automobile engineers."

Another of the more important matters which he mentioned was the appointment by the Automobile Board of Trade of a Technical Committee. This committee, he proceeded to explain, was formed with the idea of doing original work and without the idea of repeating work that is being done by the Society. Thus, for instance, such standards as are adopted by the Society will be endorsed by the Automobile Board of Trade provided the Technical Committee approves of them. Where they do not approve of the standards the committee has been invited to make suggestions, and it is hoped that in some way the work of the Society and the Automom-

bile Board of Trade may be made of mutual benefit.

Following President Souther's address which he terminated with a general review of the purposes of the various standards committees and special mention of the formation of the Truck Standards Division which took place since the last annual meeting, the reports of the standards committees on iron and steel specifications, and on ball and roller bearings were submitted. The former report contains much valuable data which it is hoped will enable purchasing departments to select with some intelligence materials that are worthy of use and that are possible to obtain. It also contains standard sizes for seamless steel tubing and sheet metals, both steel and non-ferrous. The report of the ball and roller bearings division contains much detail information, and suggested standard sizes for ball and roller bearings. The remainder of the morning session was taken up by the reading of a note on "Proportional Elastic Limit and Elastic Limit" by Henry Hess, and a paper entitled "Metal Gauges" by T. V. Buckwalter.

The afternoon session was opened by the newly elected president Henry F. Donaldson, with an address on the recent visit of the members of the Society to Europe which was followed by the reading of several papers among which were two on "Wire, vs. Wood Wheels" by Bert Morley and C. B. Hayes, respectively, one on "Worm gears" by Ralph H. Rosenberg, one on the "Minor Points and Peculiarities of Foreign Motor Car Design" by W. G. Wall and one on "Silent Chains" by Chester S. Ricker. The evening professional session was given over entirely to commercial vehicle subjects, the principal papers which were read being one on "Mechanical Points in Connection with the Construction of Solid Tires" by Charles B. Whittelsey of the Hartford Rubber Works, one on "Auxiliary Loading and Unloading Devices" by E. W. Curtis, Jr., and one on "Motor and Transmission for Commercial Cars" by Eugene P. Batzell. There followed in order the reports of Wheel Dimensions and Fastenings for Tires division, the Trucks Standards division, and the Commercial Vehicle division of the first European visit.

On Friday, the second day of the session, business was resumed, a good part of the morning being taken up by the report of the miscellaneous division of the Standards Committee, which included recommendations on magneto dimensions, lighting outfits, S. A. E. spark plug tolerances, gasoline specifications, standard gauge for pleasure and commercial cars and oversize pistons. Following the rendering of these reports, F. E. Moscovics, of the Remy Electric Co., presented a paper entitled "The Importance of Consideration of the Magneto in Engine Design." The morning session was terminated with the reading of a paper on "Automatic Spark Advance," by Lon R. Smith. The afternoon session was opened

by Forrest A. Heath, who read a paper on "Constancy of Gasolene Diffusion and Homogeneous Carburetting of Air." Following this paper, Eugene P. Batzell presented one on "Compound Gas Engines," and the session was closed with the report of the Frames Section Division of the Standards Committee.

Friday evening, of course, was the really big time of the three days' session, for it was then that the annual dinner of the Society was held. And it was a big dinner, too—the biggest and most important and most formal that the society ever has given. It was held in the Belvedere room of the Hotel Astor and close to 350 members and guests sat down. Ex-president Souther acted as toastmaster and made the opening address, in which he referred lightly to the doings of the members while they were abroad in November. His speech, however, was but a prelude to the talk that was given by the newly elected president, Henry F. Donaldson, who next was introduced. Donaldson is a fluent talker and his speech, tinged with a slight Irish accent, drew more than one smile from his hearers and several hearty good laughs. He spoke at length of the incidents of the trip abroad, though out of deference to the guests who were present, he confined himself principally to the social side of the visit and said but little of the technical significance of the first foregathering of the American and foreign automobile engineers.

R. M. Lloyd, of the General Vehicle Co., next took the floor and interested his hearers with a rambling talk in which he described many of the unusual incidents connected with the European trip. E. T. Birdsell, who really is the father of the society, followed Lloyd and spoke on the history of the society, with which no one is more familiar. Professor F. R. Hutton also made a short address, the tenor of which was the relation of the organization to engineering as a whole.

Though the gathering was typical of American industries, an international flavor was lent it by the presence of two well known Englishmen intimately connected with the automobile industry abroad. One of them is the managing director of the Wolseley company, in England, and the other holds a high position with the Scotch firm of Arroll-Johnson. Both of them made short addresses at the invitation of President Donaldson and extended the felicitations of the British engineers.

The last day of the session, Saturday, was given over entirely to technical subjects. Two papers were read, one of them on "The Balance of Automobile Motors," by Ernest R. Fried, and the other entitled "Starters for Gas Engines," by J. W. Fitzgerald, of the Ignition Starter Co., of Detroit. Following the reading of the papers, the meeting was closed with the rendering of the reports of the Broaches Division, the Carburetter Division and the Springs Division of the Standards Committee.

DETROIT SHOW DEVELOPS NEW CARS

**Three Electrics and a Steam Truck Make
Their First Appearance—Exhibition
Worthy of the "Automobile City."**

Housed peaceably and comfortably under the same roof, which roof however has been considerably extended by the addition of a temporary annex, the 87 motor car and accessory dealers who last year split into

is a series of green electric lights, and along the center there are suspended ten great candelabrae, hung on chains and fitted with decorative globes. Along the sides stretches a series of panels done in oil representing a forest, the foliage coloring producing an appropriate background for the automobiles. A border of leaves and flowers encircles the room, topping the panels.

Simplicity in the decorative scheme however, is not the only distinctive feature about the Detroit show, for five new cars

for \$2,700. The American steam truck is distinctive in that it is the only steam driven commercial vehicle now made in the country. The fifth newcomer is the Miller car, a pleasure vehicle marketed by the Miller Motor Car Co.

Seventy-three distinct lines of pleasure and commercial vehicles shown by 62 manufacturers or dealers; and the accessory booths are occupied by 25 exhibitors. The management confidently expects that when the doors will have finally closed on the



GENERAL VIEW OF DETROIT AUTOMOBILE DEALERS ASSOCIATION'S SHOW IN WAYNE GARDENS

two factions and held rival shows during the same week, placed on view with the opening of the Detroit Automobile Dealers' Association's eleventh annual show in Wayne Gardens on Monday the 22nd inst., anything and everything connected with the automobile trade from a quarter-inch cap screw to a ten-ton truck, as befits the "Automobile City."

The decorations are simple but effective. The ceiling is concealed by a huge canopy of abersheen, a special decorative fabric, and on which is painted an automobile wheel 20 feet in diameter, the spaces between the spokes being filled with panels, well illuminated from above, giving the effect of stained glass. Directly under the ceiling, following the curves of the arches

are making their bows to the public. Three electrics and, remarkable to say, one steamer—a truck. All of the electrics embrace in their construction or operation new or distinctive features. The Church-Field, the product of the Church-Field Motor Co., of Sibley, Mich., is revolutionary in that it employs a two-speed planetary transmission, and ten speed points on the controller; the Century is notable as being the first electric to adopt the underslung frame construction, while in the Colonial, the Colonial Motor Car Co. claims to have embodied nothing but the "cream" of motor car design in the construction of their shaft-driven electric brougham which is equipped with Westinghouse motors and controller, has a long wheelbase—93 inches—and sells

27th of the month, the attendance will have been double that of the show last year, and if the first two nights' attendance be any criterion, the confidence is justified. The exhibitors are as follows:

Vehicles: Abbott-Detroit Co., Abbott-Detroit; Ford Motor Car Co., Ford; United Motor Detroit Co., Sampson, Brush, Maxwell and Columbia; J. H. Brady Auto Co., Hudson; J. P. Schneider, Alco, Stevens-Duryea; Colonial Motor Car Co., Colonial electric; Buick Motor Car Co., Buick; Oldsmobile Co., Oldsmobile; Thompson Auto Co., King Car and Federal truck; Brush Motor Car Co., Brush; Grant Bros. Auto Co., Everitt; Hupmobile Sales Co., Hupmobile; Lozier Motor Car Co., Lozier; Stand-ard Auto Co., Packard; Cartercar Co., Car-

tercar; Oakland Motor Sales Co., Oakland; Chalmers Motor Car Co., Chalmers; Flanders Mfg. Co., Flanders; General Motors Truck Co., G. M. C. trucks; Hupp Corporation, R. C. H.; Paterson Motor Car Co., Paterson; Miller Car Co., Miller; M. A. Young, Elmore, Reo and Waverley; Krit Motor Car Co., Krit; Seidler Sales Co., Jackson; Neumann-Lane Co., Pierce-Arrow, Stoddard-Dayton, and Rauch & Lang, electric; Regal Motor Car Co., Regal; Warren Motor Car Co., Warren; Commerce Motor Car Co., Commerce wagon; Briggs-Detroit Co., Briggs-Detroit; Marquette Car Co., Marquette; Grinnell Electric Co., Grinnell; Church-Field Electric Co., Church-Field; Cunningham Auto Co., E-M-F, Flanders; Gillespie Auto Sales Co., Century electric; Winton Motor Car Co., Winton; Cadillac Motor Car Co., Cadillac; Lion Motor Sales Co., Peerless; Grabowsky Power Wagon Co., Grabowsky truck; Motor Wagon Co., Detroit motor wagon; Poss Motor Car Co., Poss commercial cars; Mitchell Motor Sales Co., Mitchell; Overland Motor Sales Co., Overland; Foster Motor Sales Co., Thomas and Cutting; Havers Motor Car Co., Havers; American Steam Truck Co., American truck; River-view Auto Garage Co., Kissel; Universal Motor Truck Co., Universal truck; Michigan Buggy Co., Michigan; Herreshoff Motor Sales Co., Herreshoff; Henderson Motor Sales Co., Cole; Durant-Dort Carriage Co., Best truck; W. H. Weber, Rambler; Anderson Electric Car Co., Detroit electric; Henderson Motorcycle Co., Henderson four-cylinder motorcycle.

Accessories: Sewell Cushion Wheel Co., resilient wheels; Michigan Magneto Co., magnetos; Automobile Equipment Co., accessories; Punctureless Tire Co., tires; Westinghouse Electric & Mfg. Co.; Columbia Nut & Bolt Co., lock nuts and bolts; Detroit Steering Wheel and Windshield Co., steering gears and windshields; Ignition Starter Co., Disco engine starter; Eby Auto Parts Co., parts; Electric Products Co., parts; Wayne Oil Tank & Pump Co., gasoline and lubricants storage apparatus; Cunningham Auto Co., accessories; Chas. E. Miller, Pan American Oils, Brampton chains and supplies; S. & S. Shock Absorber Co., S. & S. shock absorber; Ruby Mfg. Co., accessories; Jackson-Church-Wilcox Co., parts; Murphy Power Garage, accessories.

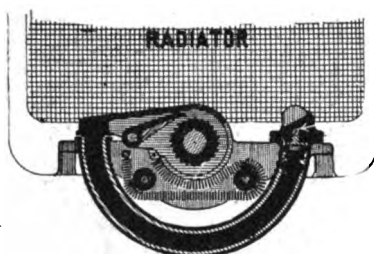
Matheson Gear Box Remains on Axle.

Due to confusion with another car, in dealing with the Matheson car exhibit at the New York show, the Motor World stated that the position of the gear box had been changed from the rear axle to the more conventional forward location, when, as a matter of fact, there had been no change of the sort. The gear box remains on the rear axle, and the only change made consists in placing a partition between the differential and the chain speed gear, so that different lubricants can be used in the two gear cases.

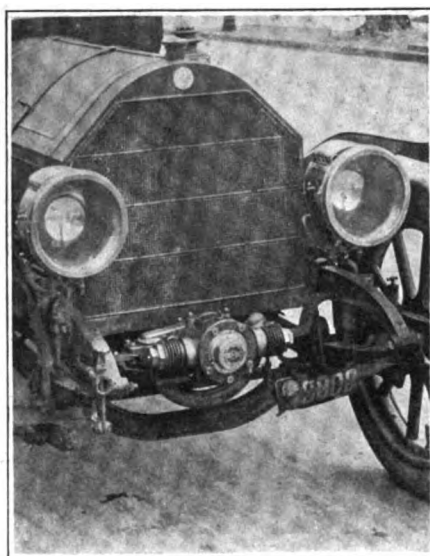
"AIR CRANK" APPEARS IN DETROIT

Crescent Engine Starter so Termed by Its Makers—"Semi-Circular" Cylinder One of Its Many Radical Features.

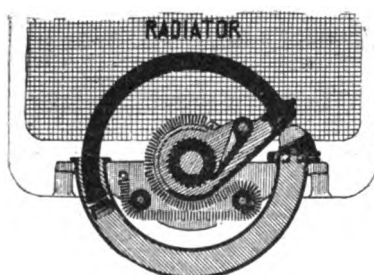
In entering the field with the Crescent air system, the Crescent Air System Co., of which Floyd W. Owen is the head, and which recently was formed with headquarters in Detroit, has undertaken to introduce



READY TO CRANK



CRESCENT AIR SYSTEM



THE OPERATION COMPLETE

an air compressor and an engine starting device which is not without distinctive features of a radical nature. As its name implies, and it might be added in parenthesis that the manufacturers lay particular stress on this feature, "it is more than a so-called 'self-starter'; it is a complete compressed air system," and as such embraces three essential parts—a two-cylinder opposed air compressor, an air tank and the engine-starting device. The auxiliary apparatus includes the usual piping, and a combined air pressure gauge and valve located on the dash.

Though each of the separate elements incorporates distinctive features, without doubt the engine-starting device is the most unique of them all; it is absolutely new in conception and is like nothing else of its kind on the market. Briefly, it consists of a semi-circular cylinder in which there is a piston, the arrangement of the component parts being shown in the accompanying illustrations. When a charge of compressed air is admitted behind the piston it is forced around, a pawl automatically engaging a ratchet wheel which takes the place of the ordinary starting crank. Immediately the piston reaches the other end of the cylinder it is spring-returned automatically to its original position, and the operation is repeated as long as the valve is held open and there is air in the tank. One of the noteworthy features of the device is that the return movement is rapid enough to permit a continuous rotative movement being imparted to the crankshaft for which reason, it is claimed, the starter will start any engine even in the coldest weather.

The air-compressor is of the two-cylinder opposed type and is air-cooled, flanges cast on the cylinder heads assisting in the radiation of heat. The most distinctive feature of the compressor is its method of mounting and the means by which it is driven. As may be seen in the accompanying illustration, it is mounted directly in front of the starter—the manufacturers style the latter device an "air crank"—to which it is attached. The engine shaft extends through the "air crank" to the compressor, connection being made by means of a clutch operated from the driver's seat. Thus, when the pressure drops below a certain figure it is merely necessary for the operator to connect the compressor, which is independent of the operation of the "air crank," and refill the tank. As the tank itself is tested to withstand more than twice the pressure the pump is capable of obtaining, there is an ample factor of safety. By way of insuring that the air in the tank will stay there for long periods when the car is not in use, particular attention has been given the piping and joints with a view to preventing leakage. Though it might be supposed that the utility of the system would stop with the starting of the engine such is not the case. As a matter of fact the manufacturers base their claim to the title "complete air system" on the fact that the air may be used for a multitude of other purposes as well. Thus, for instance, a long rubber hose with suitable connections is furnished for pumping tires and for dusting the car. Auxiliary uses for the air which also are suggested include the operation of air brakes, the sounding of an air signal and the placing of pressure on gasoline and oil tanks. At present, the system is being manufactured in two forms, the first being readily applicable to any car and the second being intended for application by manufacturers as standard equipment; neither of them will be ready for delivery till March 1st, however.

Ebbs and Flows Indicated by Show Statistics

Figures Embracing a Span of Twelve Years That Mark the Arrivals and Departures of Successive Waves of Progress—How Gasolene Engulfed Steam and Four Cylinder Engines Put All Other Types to Rout.

While statistics generally are considered extremely dry reading, nevertheless they are important "literature," and nothing quite so clearly reveals the tendencies of trade, of business or even of character, as a carefully prepared set of statistics covering a period of years. This is true of the

riage and the first year of the twentieth century saw a great increase of steam-propelled carriages, it was thought that this style of vehicle eventually would dominate the industry. How erroneous this idea was is shown by the fact that at this year's automobile shows not a single steam vehicle

orable comment from both competent and incompetent critics, the general public will refuse to enthuse over them, and they die out quickly. As such may be considered the three, five and eight-cylinder motors exhibited previous to 1910—the last two years saw no odd-numbered motor on exhibition, with the sole exception of the single-cylinder machine.

While as late as 1905 the four-cylinder motor only equaled in number those of the one, two, three and six-cylinder variety combined, in 1912 it outnumbered all the rest by four to one. With the sole exception of the elimination of the steam car, the figures for the last three shows are remarkably equal, thereby clearly indicating that a period of stability and standardization has been reached, and that no such kaleidoscopic changes as featured former shows may be looked for hereafter. The six-cylinder motor for the past five years practically has remained stationary, as far as numbers of cars exhibited at New York are concerned; the four-cylinder motor is represented in 1912 by about the same number of cars as in 1906; but the same cannot be said of the two-cylinder machine and the "one-lunger." The latter, which in 1905 mustered 25 adherents, was represented by a trio of cars, while the former (in its four-cycle variety) could only point to one solitary car as its representative, although in 1905 no less than 50 cars possessed twin cylinders. No gains or losses were found to exist in the two-cycle representatives.

Despite the wonderful advance of the gasolene vehicle the electric car did not suffer in popularity, the 23 cars of this variety shown at this year's exhibit being merely a small indication of the great number of electrics in use. The untrustworthiness of such statistics as these in regard to the actual condition of the trade at the time is shown especially clearly in connection with the exhibit of electric cars. According to the actual figures it would seem as if the electric car had lost 50 per cent. or more of the popularity which it enjoyed in 1903, while exactly the contrary is correct. The electric not only has not lost, but it has gained immensely, both in the numbers of manufacturers making this style of car, and also in the aggregate number of cars produced.

Taking up the question of tendency in body construction, remarkable changes are indicated from year to year in the statistics. Following the tidal wave of roadster

SHOW STATISTICS COVERING THE YEARS 1900-1912

	1900 (Oct.)	1901 (Oct.)	1903 (Jan.)	1904	1905 *	1906	1907 (Jan.)	1907 (Oct.)	1909 †	1910	1911	1912
Electric	49	20	51	48	31	31	40	44	34	35	7	23
Steam	34	55	34	9	4	10	9	7	9	1	1	
Combination				2								
Gasolene cars.....	41	58	168	241	177	389	353	284	317	327	362	317
1 cylinder.....					25	10	6	6	13	5	6	3
2 cylinders.....					50	51	35	38	42	11	9	1
3 cylinders.....					5	5	9	4	3			
4 cylinders.....					96	274	368	248	275	326	340	246
5 cylinders.....						1						
6 cylinders.....					2	6	19	47	50	62	56	54
8 cylinders.....							2	2		1		
2-cycle—												
2 cylinders.....									2		2	2
3 cylinders.....									2	2		
4 cylinders.....									2	3	13	4
4 cylinders, sleeve valve...												6
6 cylinders, sleeve valve...												1
Bodies—												
Runabouts							78	119	151	86	75	79
Touring cars.....							154	138	109	179	237	188
Closed cars.....							92	75	100	128	61	50
Chassis							86	61	77	81	74	66
Equipped with engine starter												106

* Previous to 1905 no detailed census was taken at the shows.

† Previous to 1909 two-cycle cars, while exhibited, were not specifically enumerated in the Motor World's show census.

automobile trade as well as of other trades and manufacturers, the only difficulty in the case of the former being its youth, and therefore the comparatively slender material which can be used in making up statistics of the kind that are worth while.

To deduce certain facts from an aggregation of figures covering centuries in time and millions of people or objects, is not very difficult and is a fairly safe proceeding. To do the same thing in the automobile business is quite a different undertaking. Statistics are like double-edged swords; handled awkwardly they are dangerous to the user. In order to avoid haphazard generalization, or erroneous conclusions, figures extending over only one decade should not be considered final and absolute proof of certain suspected tendencies.

When, for instance, the few years between the introduction of the steam car has been exhibited—the only manufacturer producing these cars in any appreciable

quantity having decided not to exhibit them. Steam cars are almost, but not quite, things of the past—and yet a study of the statistics of 1898-99-1900, would not have indicated such an early demise. Similarly it is quite possible that the statistics compiled from the twelve annual motor shows held in New York may not be trusted as far as an accurate forecast of the future of the automobile industry for the next ten years is concerned, but that these statistics indicate certain trends in manufacturing and furnish a resume of present ideas in construction, there can be no doubt.

Nothing probably impresses the student of automobile show statistics quite as strongly as the short life of so-called "freaks" in construction. The common sense of the buying public as well as the experience of the manufacturer steer shy of anything that can be considered "freakish," and although such oddities may attract considerable attention and even fav-

popularity in 1909 there came the inevitable reaction, and while the number of roadsters and runabouts exhibited dropped from 151 in 1909, to 86 in 1910, that of touring cars rose by almost exactly the same amount, while even closed cars increased by 28 per cent. Still further falling back the roadster runabout division was able to muster but 75 adherents in 1911, while the closed car ranks suffered to the extent of 50 per cent. The gains made were all credited to the touring car division, which counted 237 representatives. The body this year is the "standard" touring body, only two cars of touring size being shown with the old style "open" or doorless front. Last year 67 "open" touring cars were shown, together with 116 of the "closed" variety. The greater comfort and protection from inclement weather offered by such bodies, fully equipped with top and windshield, in a large measure may be held responsible for the smaller number of limousines and other closed cars shown; particularly noticeable in this respect being the nearly complete disappearance of the landaulet type of body.

In the matter of special equipment or mechanical innovations of revolutionary type two devices loom head and shoulders above all others. They are the engine-starter and the so-called "valveless" motor—meaning a motor without poppet valves, but of four-cycle construction. While the engine-starter as an auxiliary equipment is not new, it having been used for years by the Winton company and on Amplex, Royal Tourist, Renault and Chadwick cars, as well as Saurer trucks since 1909, it only this year attained real prominence, when no less than 106 cars out of 317 exhibited were equipped with starting devices of some sort, comprising 13 systems, shown by 40 makers. The sleeve-valve of the Knight type was the only one shown fitted to a car, at either the Grand Central Palace or Madison Square Garden, there being seven representatives present, comprising six four-cylinder machines and one six-cylinder car.

The figures shown in the accompanying table give the statistics of the New York shows, the exhibitions in both the Palace and the Garden (or Armory and Garden) having been considered as one show, and the cars exhibited added together to make up this list. The Chicago shows have not been taken into consideration, because they always have been "open" shows and, in a sense, were duplicates of the New York exhibits.

Simple Means of Softening Hard Steel.

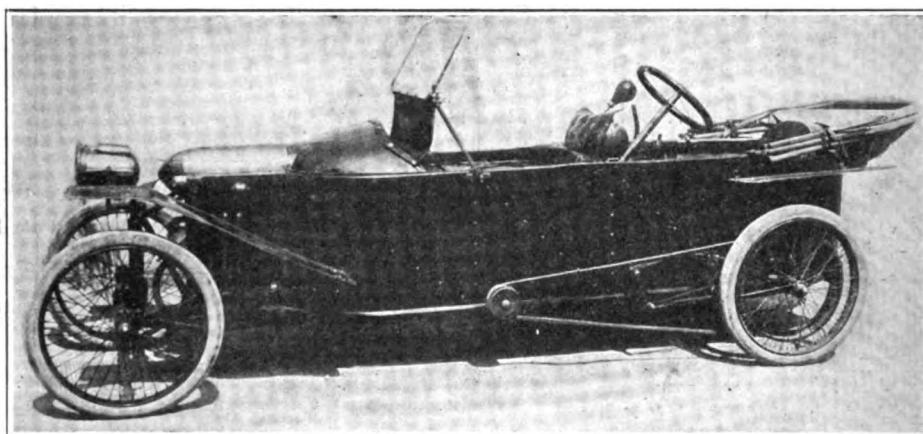
A piece of steel that is too hard to be filed or otherwise shaped may be softened by heating to a good red heat and allowing it to cool in the slowest possible way—for instance, by burying it in lime, or even in the ashes of the fire. If time is pressing, the mere heating of the steel and cooling in the open air will soften it enough to allow it to be worked.

BEDELIA—"THE MISSING LINK"

French Contrivance That is a Cross Between Motor Car and Motorcycle—Of Possible Interest to Flat-Dwellers.

To many people the problem of buying an automobile is not half so serious as the question of what to do with it after it has been bought—that is, where to house it while not on the road. The average New York apartment house, for instance, obviously was not designed with a view to providing accommodations for motor cars, and even the New York back yard—possibly the appellation is somewhat strained—is secure from the invasion of an automobile of the usual type, even of the smallest size familiar to the American public. So

in front, enclosing the motor, which is air-cooled and of the motorcycle type, and may be had with one or two cylinders, from 4 to 10-horsepower. Power is transmitted by chain to a countershaft, and thence to the rear wheels by belts, which are loosened and permitted to slip when it is desired to "throw off" the power. Steering is effected by swinging the front axle and wheels on a pivot, the automobile type steering wheel being connected to the axle by means of steel cables which are always under tension. The central pivot on which the axle turns carries the helical spring which forms the front spring suspension of the car; the rear end is carried on two leaf springs shackled at the forward end and having the rear ends attached to the rear axle. This gives the car a three-point suspension, eliminating danger of twisting the light framing. The front end of the body has a regular skuttle effect, the hood tapering



UNIQUE FRENCH CAR WITH TANDEM SEATS—THE BEDELIA

the flat-dweller who decides that a car is necessary to his happiness has to store it in a garage, often at an inconvenient distance, and his rides are sandwiched between journeys afoot or by trolley, and his cost of maintenance is higher than it would be if the machine were close at hand so he could care for it in his odd moments.

It seems, however, that they do these things better in France. Working on the principle that if the house is not built to suit the car, the car must be built to suit the house, an enterprising concern has brought out a little machine bearing the musically reminiscent monicker "Bedelia," in which it is sought to combine, to the greatest possible extent, the lightness, compactness and simplicity of the motorcycle, and the comfort and sociability of the motor car. The result is a two-passenger vehicle in which the occupants sit tandem, the driver in the rear, the passenger being given the most comfortable place, with true French politeness. The seats are real seats, not merely saddles, and are enclosed in a low body which is referred to as a "torpedo," but which, with due regard for veracity, must be described as being almost exactly the shape of a big bath tub. At the front end there is an "annex," open

down to meet the top of the forward compartment in which the motor is enclosed; the cylindrical gasoline tank, holding between three and four gallons, forms the rounding top of the motor housing. Wire wheels are used and wide mudguards protect the passengers from flying mud.

While the little machine carries two passengers and is capable of considerable speed, its weight is but 375 pounds, and it can be lifted by two men; it has a total overall length of 125 inches, and a total width of 43 inches. Fitted up with a top, windshield and lamps, it has the appearance of a diminutive automobile—the "missing link" between the motorcycle and the full-fledged motor car.

Powdered Glass Better Than Emery.

While the use of emery for grinding in valves is common, it is better to use powdered glass or some of the prepared compounds put up for the purpose. Emery has a faculty of embedding itself in metal and staying to scratch, and it is advisable, if it must be used, to do the final grinding with a very fine grade—flour emery or crocus—and to clean the ground surfaces thoroughly with gasoline so as to remove all traces of the abrasive material.



WHAT THE CHICAGO SHOW WILL OFFER

It Will Include Most of the Cars That Were Exhibited in New York and Sixteen That Were Not Displayed in the East—Coliseum and Armory Both Will Be Full to Overflowing But No Startling Novelties Are Foreshadowed.

Always has the management of the Chicago automobile show taken more than a pardonable pride in its decorative schemes or themes—in the artistic spirit in which they were conceived, and in the masterly style, freshened with a flavor of the breezy West, in which they were executed and spread out for the show-going thousands to see. Managerial personnel has wrinkled its brows and burned midnight oil and taken all kinds of pains to beautify the yawning depths of the Coliseum, and to cause the barrenness of the Armory to blossom with brilliant color in seductive array. The exhibits themselves—the pleasure cars, the commercial vehicles, the accessories—always could be depended upon to do the occasion the fullest justice, providing an abundance of things well worth looking at, and well worth buying, too, for that matter.

There never was a Chicago automobile show that was lacking in that which is the spice of motor car exhibitions as well as of life in general—variety; and there never yet was a Chicago show that failed to bring to light something that was out of the ordinary, to add its own peculiar savor to the spice of variety. For instance, was it not a Chicago show that brought to light the now famous "Silent Knight" motor? What though that revolutionary engine was tucked away in an inconspicuous corner; and what though the electric motor and the gearing that drove it were so noisy that it was impossible to tell whether the motor was "silent" or not? It was the Chicago show that brought it out. And though it is quite safe to wager that not every year—no, nor every decade—will see the birth of anything so far-reaching as the sleeve valve motor, it is equally safe to assert that not a year will pass and not a Chicago show will be held without the appearance of something really and radically new—at least, as

nearly new as anything under the sun can be. So, clearly, the exhibits take care of themselves so far as quantity, quality and variety are concerned, and the only worry of the management, of the long-headed, experienced manager, Samuel A. Miles, who acts for the National Association of Automobile Manufacturers, so far as they are concerned, is to get them all under cover and in their places in time for the grand musical opening—the exhibits take care of themselves, but the decorations will not; hence the frontal corrugations and the mental wrestlings and artistic strugglings of the "powers that be," resulting, as already has been intimated, in symphonies of color and curve that, once seen, never can be forgotten. Last year the show was "served up with French dressing," so far as the Coliseum was concerned, Louis XV, who unfortunately died too soon to see the full flowering of the seed he planted, being responsible for the riot of color and plaster of Paris that defied description. The year before was less striking only because each year must outdo the year before; and this year—

This year it is a deep, dark secret. Doubtless by this time the buildings are decorated—or nearly so—and doubtless there are many in Chicago, and maybe some in New York, who know what is the fashion of those decorations; but, equally without doubt, they have sealed their lips, for no inkling of what awaits has escaped. The inference is that there is something in the nature of a surprise in store, else why this unusual silence? And once again without doubt, whatever the artistic scheme may be, it will be worth the seeing.

Like the Garden show in New York, the Chicago show will be divided into two sections, one for pleasure cars, and the other for commercial vehicles, each with its hosts of accessory dealers and each running for

a week. As usual, there will be several cars shown that were not seen at either of the New York exhibitions. Owing however, to the large contingent of Western makers who displayed their products in the Grand Central Palace in New York, there will not be quite as many of these as usual—only 12 out of the gasoline pleasure cars will be unfamiliar to those who saw the New York shows, and four of the electric cars. And there will be more cars shown at the Coliseum and the Armory than there were at the biggest of the New York shows this year—97 as against 60—and more than at last year's Chicago show by the small majority of four. New York holds the palm in the matter of exhibits of accessories, however, for there were 329 concerns showing the thousand and one things, little and big, that help to make the car or to make it comfortable, while the Western city will have but 184. Of this number, however, 18 were "missing" from the Garden and the Palace.

While the New York shows, because of precedence, naturally skim the cream and rob Chicago of much interest, there will be at least two brand new cars on exhibition—cars that have not been seen at any show. These are the Davis, a 40-horsepower model with a four-cylinder block-cast motor, built by the George W. Davis Carriage Co., of Richmond, Ind., and the Ideal, an electric machine produced by the Borland-Grannis Co., of Chicago. Three other electrics will be on hand that were not in New York—the Broc, Rauch & Lang and Woods. In addition, the Chicago show will stage the gasoline cars of 11 manufacturers who did not bring their products to New York. There will be the Austin Automobile Co., whose big cars always have had an air of smartness and refinement; James Cunningham & Son, whose overhead enclosed valve operating mechanism is a feature; the Bar-

tholomew Co., whose Glide car is well known; the Streater Motor Car Co., whose Halladay cars will take a lot of beating; the Kissel Motor Car Co., and the Lexington Motor Car Co., the Republic Motor Car Co. and the Staver Carriage Co., the Colby Motor Co., Crow Motor Car Co.,

builder of the Crow-Elkhart car; and Haberer & Co., manufacturers of the Cino, all of them seasoned productions that cannot fail to command notice.

Taking everything into consideration—that is to say, considering everything that can be considered in view of the almost

certainty that the show will develop its wonted crop of surprises—it is just as safe to say that the Chicago national show of 1912 will be "the best" as it is to say that Samuel A. Miles has made it as good as he knows how—and that certainly is putting it strongly.

Summary of Car Exhibitors and Their Locations

Unless otherwise noted the exhibits are located in the Coliseum. Cars denoted by * were not shown in New York.

Gasolene Pleasure Cars.

Abbott Motor Co., Detroit, Mich. (L1)—Abbott-Detroit.
American Locomotive Co., Providence, R. I. (M1)—Alco.
American Motors Co., Indianapolis, Ind. (G3 Armory)—Auburn.
Austin Auto Co., Grand Rapids, Mich. (D3 Armory)—Austin.*
Bartholomew Co., Peoria, Ill. (Q3)—Glide.*
Bergdoll Motor Co., Louis J., Philadelphia, Pa. (7)—Bergdoll.
Brush Runabout Co., Detroit, Mich. (E1)—Brush.
Buick Motor Co., Flint, Mich. (A4)—Buick.
Cadillac Motor Car Co., Detroit, Mich. (D4)—Cadillac.
Cartercar Co., Pontiac, Mich. (C4 Armory)—Cartercar.
Case, J. I., Co., Racine, Wis. (B4 Armory)—Case.
Chalmers Motor Co., Detroit, Mich. (C4)—Chalmers.
Clark-Carter Automobile Co., Jackson, Mich. (F1 Armory)—Cutting.
Colby Motor Co., Mason City, Ia. (11)—Colby.
Cole Motor Car Co., Indianapolis, Ind. (N1)—Cole.
Columbus Buggy Co., Columbus, Ohio (A3 Armory)—Firestone-Columbus.
Columbia Motor Car Co., Hartford, Conn. (F1)—Columbia.
Corbin Motor Vehicle Corp., New Britain, Conn. (F4)—Corbin.
Crow Motor Car Co., Elkhart, Ind. (3)—Crow-Elkhart.*
Cunningham & Son, James, Rochester, N. Y. (E4 Armory)—Cunningham.*
Davis Carriage Co., George W., Richmond, Ind. (17)—Davis.*
Dayton Motor Car Co., Dayton, Ohio (D2)—Stoddard-Dayton.
De Tamble Motor Co., Anderson, Ind. (D4 Armory)—De Tamble.
Elmore Manufacturing Co., Clyde, Ohio (O1)—Elmore.
Fiat Automobile Co., Poughkeepsie, N. Y. (E6 Armory)—Fiat.
Franklin, H. H., Mfg. Co., Syracuse, N. Y. (A3)—Franklin.
Garford Co., The, Elyria, Ohio (C1 Armory)—Garford.
Great Western Automobile Co., Peru, Ind. (E5 Armory)—Great Western.
Haberer & Co., Cincinnati, O. (18)—Cino.
Haynes Automobile Co., Kokomo, Ind. (F3)—Haynes.

Hudson Motor Car Co., Detroit, Mich. (B4)—Hudson.
Hupp Corporation, Detroit, Mich. (A1 Armory)—R-C-H.

CARS TO BE EXHIBITED

Gasolene Cars.

ABBOTT-DETROIT	LION
ALCO	LOCOMOBILE
AMERICAN	LOZIER
AMPLEX	MARMON
AUBURN	MARQUETTE
AUSTIN*	MATHESON
BERGDOLL	MAXWELL
BRUSH	McFARLAN
BUICK	McINTYRE
CADILLAC	MICHIGAN
CARTERCAR	MITCHELL
CASE	MOLINE
CHALMERS	MOON
CINO*	NATIONAL
COLBY*	OAKLAND
COLE	OHIO
COLUMBIA	OLDSMOBILE
CORBIN	OTTOMOBILE
CROW-ELKHART*	OVERLAND
CUNNINGHAM*	PACKARD
CUTTING	PAIGE-DETROIT
DAVIS*	PATERSON
DE TAMBLE	PEERLESS
ELMORE	PIERCE-ARROW
E-M-F	POPE-HARTFORD
EVERITT	PREMIER
FIAT	PULLMAN
FIRESTONE-	RAMBLER
COLUMBUS	R-C-H
FRANKLIN	REGAL
GARFORD	REO
GLIDE*	REPUBLIC*
GREAT WESTERN	SELDEN
HALLADAY*	STAYER*
HAYNES	STEARNS
HUDSON	STEVENS-DURYEA
HUPMOBILE	STODDARD-
IMPERIAL	DAYTON
INTER-STATE	STUTZ
JACKSON	THOMAS
KING	WARREN
KISSELKAR*	WESTCOTT
KNOX	WHITE
KRIT	WINTON
LEXINGTON*	

Electric Cars.

BAKER	OHIO
BROC*	RAUCH & LANG*
DETROIT	STANDARD
FLANDERS	WAVERLEY
IDEAL*	WOODS*

Hupp Motor Car Co., Detroit, Mich. (G2)—Hupmobile.
Ideal Motor Car Co., Indianapolis, Ind. (1)—Stutz.
Imperial Automobile Co., Jackson, Mich. (F2 Armory)—Imperial.

Inter-State Automobile Co., Muncie, Ind. (A4 Armory)—Inter-State.
Jackson Automobile Co., Jackson, Mich. (D1 Armory)—Jackson.
Jeffery Co., Thos. B., Kenosha, Wis. (A2)—Rambler.
King Motor Car Co., Detroit, Mich. (16)—King.
Kissel Motor Car Co., Hartford, Wis. (E1 Armory)—Kisselkar.*
Knox Automobile Co., Springfield, Mass. (E4)—Knox.
Krit Motor Car Co., Detroit, Mich. (E3 Armory)—Krit.
Lexington Motor Car Co., Connorsville, Ind. (12)—Lexington.*
Lion Motor Car Co., Adrian, Mich. (10)—Lion.
Locomobile Co. of America, Bridgeport, Conn. (B2)—Locomobile.
Lozier Motor Co., Detroit, Mich. (B3)—Lozier.
McFarlan Motor Car Co., Connorsville, Ind. (G5 Armory)—McFarlan.
McIntyre Co., W. T., Auburn, Ind. (G2 Armory)—McIntyre.
Marquette Motor Co., Saginaw, Mich. (B1 Armory)—Marquette.
Matheson Automobile Co., Wilkes-Barre, Pa. (J1)—Matheson.
Maxwell-Briscoe Motor Co., Tarrytown, N. Y. (D1)—Maxwell.
Metzger Motor Car Co., Detroit, Mich. (G1)—Everitt.
Michigan Buggy Co., Kalamazoo, Mich. (9)—Michigan.
Mitchell-Lewis Motor Co., Racine, Wis. (K1)—Mitchell.
Moline Automobile Co., East Moline, Ill. (B2 Armory)—Moline.
Moon Motor Car Co., St. Louis, Mo. (G6 Armory)—Moon.
National Motor Vehicle Co., Indianapolis, Ind. (C5)—National.
Nordyke & Marmon Co., Indianapolis, Ind. (A5)—Marmon.
Oakland Motor Car Co., Pontiac, Mich. (H1)—Oakland.
Ohio Motor Car Co., Cincinnati, Ohio (13)—Ohio.
Olds Motor Works, Lansing, Mich. (B6)—Oldsmobile.
Ottomobile Co., Philadelphia, Pa. (8)—Otto.
Packard Motor Car Co., Detroit, Mich. (C1)—Packard.
Paige-Detroit Motor Car Co., Detroit, Mich. (16)—Paige-Detroit.

Paterson Co., W. A., Flint, Mich. (G4 Armory)—Paterson.
 Peerless Motor Car Co., Cleveland, Ohio (D6)—Peerless.
 Pierce-Arrow Motor Car Co., Buffalo, N. Y. (C2)—Pierce-Arrow.
 Pope Manufacturing Co., Hartford, Conn. (C6)—Pope-Hartford.
 Premier Motor Mfg. Co., Indianapolis, Ind. (D3)—Premier.
 Pullman Motor Car Co., York, Pa. (E3)—Pullman.
 Regal Motor Car Co., Detroit, Mich. (D2 Armory)—Regal.
 Reo Motor Car Co., Lansing, Mich. (B5)—Reo.
 Republic Motor Car Co., Hamilton, Ohio (15)—Republic.*
 Selden Motor Vehicle Co., Rochester, N. Y. (Q2)—Selden.
 Simplex Motor Car Co., Mishawaka, Ind. (C3 Armory)—Amplex.
 Staver Carriage Co., Chicago, Ill. (E2 Armory)—Staver.*
 Stearns Co., F. B., Cleveland, Ohio (H2)—Stearns.
 Stevens-Duryea Co., Chicopee Falls, Mass. (C3)—Stevens-Duryea.
 Streator Motor Car Co., Streator, Ill. (6)—Halladay.*
 Studebaker Corp., Detroit, Mich. (A6)—E-M-F and Flanders.

Thomas, E. R., Motor Car Co., Buffalo, N. Y. (E2)—Thomas.
 Warren Motor Car Co., Detroit, Mich. (G1 Armory)—Warren.
 Westcott Motor Car Co., Richmond, Ind. (2)—Westcott.
 White Co., The, Cleveland, Ohio (F2)—White.
 Willys-Overland Co., Toledo, Ohio (D5)—Overland.
 Winton Motor Carriage Co., Cleveland, Ohio (A1)—Winton.

Electric Pleasure Vehicles.

Anderson Electric Car Co., Detroit, Mich. (C2 Armory)—Detroit.
 Baker Motor Vehicle Co., Cleveland, Ohio (O2)—Baker.
 Borland-Grannis Co., Chicago, Ill. (4)—Ideal.*
 Broc Electric Vehicle Co., Cleveland, Ohio (5)—Broc.*
 Ohio Electric Car Co., Toledo, Ohio (P1)—Ohio.
 Rauch & Lang Carriage Co., Cleveland, Ohio (B3 Armory)—Rauch & Lang.*
 Standard Electric Car Co., Jackson, Mich. (14)—Standard.
 Flanders Mfg. Co., Pontiac, Mich. (H1 Armory)—Flanders.
 Waverley Co., Indianapolis, Ind. (A2 Armory)—Waverley.

Woods Motor Vehicle Co., Chicago, Ill. (B1)—Woods.*

Motorcycles.

Aurora Automatic Machinery Co., Aurora, Ill. (94-95)—Thor.
 Consolidated Manufacturing Co., Toledo, Ohio (127-129)—Yale.
 Emblem Manufacturing Co., Angola, N. Y. (147-150)—Emblem.
 Excelsior Supply Co., Chicago, Ill. (131-132)—Excelsior.
 Flanders Manufacturing Co., Pontiac, Mich. (80-81)—Flanders.
 Harley-Davidson Motor Co., Milwaukee, Wis. (124-126)—Harley-Davidson.
 Hendee Manufacturing Co., Springfield, Mass. (136-139)—Indian.
 Henderson Motorcycle Co., Detroit, Mich. (114)—Henderson.
 Miami Cycle & Mfg. Co., Middletown, Ohio (153-155)—Merkel.
 Minneapolis Motorcycle Co., Minneapolis, Minn. (79)—Minneapolis.
 New Era Auto-Cycle Co., Dayton, Ohio (142-144)—New Era.
 Pierce Cycle Co., Buffalo, N. Y. (151-152)—Pierce.
 Pope Manufacturing Co., Hartford, Conn. (145-146)—Pope.
 Reading-Standard Co., Reading, Pa. (133-135)—Reading-Standard.
 Wagner Motorcycle Co., St. Paul, Minn. (130)—Wagner.

Summary of Accessory Exhibitors and Their Locations

Space numbers indicated by an A are in the Armory; all others in the Coliseum. Exhibits denoted by * were not shown in New York.

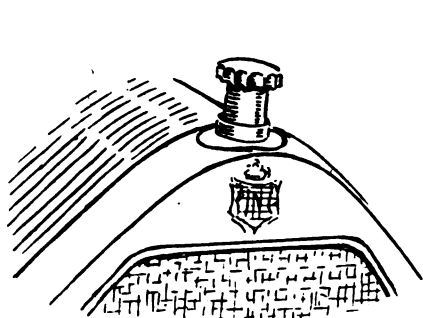
Ajax-Grieb Rubber Co., New York City (26 and 27)—Ajax tires.
 Allen Auto Spec. Co., New York City (149)—Tire covers, locks and holders.
 American Ball Bearing Co., Cleveland, Ohio (29)—Ball bearings and axles.
 American Circular Loom Co., Aldene, N. J. (87)—No-lag magneto.
 Apple Electric Co., Dayton, Ohio (98)—Aplco ignition and lighting system.
 Atlas Chain Co., Brooklyn, N. Y. (2A)—Atlas tire chains.
 Atwater Kent Mfg. Works, Philadelphia, Pa. (6)—Uni sparker and other ignition apparatus.
 Auburn Auto Pump Co., Auburn, N. Y. (94)—Tire pumps and pneumatic jacks.
 Automatic Motor & Engineering Co., Chicago, Ill. (14A)—Church pneumatic transmission system.
 Auto Parts Mfg. Co., Muncie, Ind. (82)—Parts.
 Automobile Supply Mfg. Co., Brooklyn, N. Y. (142)—Newtone horns.
 Avery Portable Lighting Co., Milwaukee, Wis. (128)—Electrobola lamps.
 Badger Brass Mfg. Co., Kenosha, Wis. (41)—Solar lamps and generators.
 Baldwin Chain & Mfg. Co., Worcester, Mass. (61)—Baldwin chains and recoil checks and Brown steering gears.
 Barco Brass & Joint Co., Chicago, Ill. (4A)—Exhaust horns and cut-out valves.*

Batavia Rubber Co., Batavia, N. Y. (126)—Batavia tires.
 Booth Demountable Rim Co., Cleveland, O. (96)—Booth demountable rims.
 Bower Roller Bearing Co., Detroit, Mich. (253)—Bower roller bearings.
 Bowser & Co., S. F., Inc., Fort Wayne, Ind. (71 and 72)—Bowser gasoline and oil storage apparatus.
 Breakstone, S., Chicago, Ill. (24A)—Briggs & Stratton Co., Milwaukee, Wis. (113)—B. & S. igniters.
 Briscoe Mfg. Co., Detroit, Mich. (24)—Radiators and fittings.
 Brown Co., Syracuse, N. Y. (20A)—Brown tire pumps, lamp lighters and tire racks.
 Bown-Lipe Gear Co., Syracuse, N. Y. (65)—Transmissions, differentials and steering gears.
 Buda Co., Harvey, Ill. (110)—Motors, gears, forgings, and jacks.
 Byrne, Kingston & Co., Kokomo, Ind. (75)—Kingston carbureters.
 Champion Ignition Co., Flint, Mich. (92)—A-C spark plugs, coils, timers, etc.
 Chilton Co., Philadelphia, Pa. (34A)—Publications.
 Class Journal Co., New York City (35A) (40A)—Publications.
 Clucker & Hickson Co., New York City (605)—Lamps and tire casings.
 C. M. B. Wrench Co., Syracuse, N. Y. (11A)—Silver King socket wrench.

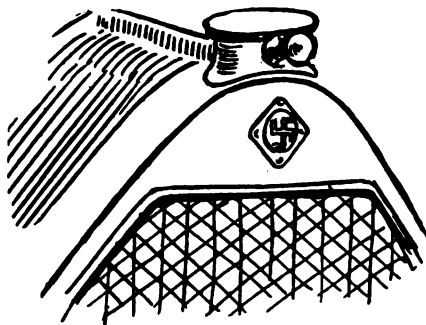
Columbia Lubricants Co., New York City (135)—Monogram oils and greases.
 Connecticut Telephone & Electric Co., Meriden, Conn. (16)—Connecticut shock absorbers, spark coils, magnetos and other ignition specialties.
 Consolidated Rubber Tire Co., New York City (34 and 35)—Kelly-Springfield tires.
 Continental Motor Mfg. Co., Muskegon, Mich. (62)—Continental motors.
 Continental Rubber Works Co., Erie, Pa. (139)—Inner tubes.
 Cook's Sons, Adam, New York City (132)—Lubricants.
 Covert Motor Vehicle Co., Lockport, N. Y. (88)—Change gear mechanism.
 Cowles & Co., C., New Haven, Conn. (134)—Forgings, mountings, and trimmings.
 Cramp & Sons Ship and E. B. Co., Wm., Philadelphia, Pa. (55)—Bronze and bearing metals.
 Dean Electric Co., Elyria, O. (78)—Tutohorns and Dynalux lighting systems.
 Detroit Electric Appliance Co., Detroit, Mich. (93)—Delco electric lighting apparatus and engine starters.
 Diamond Chain & Mfg. Co., Indianapolis, Ind. (54)—Chains and sprockets.
 Diamond Rubber Co., Akron, O. (18 and 19)—Diamond tires.
 Dixon Crucible Co., Joseph, Jersey City, N. J. (130)—Graphite lubricants.

- Doehler Die Casting Co., Brooklyn, N. Y. (145)—Die cast parts.
- Dorian Remountable Rim Co., New York City (117)—Dorian remountable rims.
- Dover Stamping & Mfg. Co., Cambridge, Mass. (153)—Drip pans and funnels.
- Double-Fabric Tire Co., Auburn, Ind. (143)—Tires and inner tubes.
- Driggs-Seabury Ordnance Corp., Sharon, Pa. (10)—Frames, transmissions, crank shafts, etc.
- Eagle Co., Newark, N. J. (9A)—Windshields.
- Edelmann & Co., E., Chicago, Ill. (27A)—Edison Storage Battery Co., Orange, N. J. (106)—Storage batteries.
- Edmunds & Jones Mfg. Co., Detroit, Mich. (73)—Lamps.
- Eisemann Magneto Co., New York City (83)—Eisemann magnetos.
- Electric Storage Battery Co., Philadelphia, Pa. (69B)—Storage batteries.
- Empire Tire Co., Trenton, N. J. (109)—Empire tires, inner tubes, etc.
- Esterline Co., Lafayette, Ind. (120)—Matchless electric lighting and ignition system.
- Falls Machine Co., Sheboygan Falls, Wis. (121)—Falls motors.
- Federal Rubber Mfg. Co., Milwaukee, Wis. (107)—Federal tires.
- Findeisen & Kropf Mfg. Co., Chicago, Ill. (19A)—Rayfield carburettors.
- Firestone Tire & Rubber Co., Akron, O. (67-68)—Firestone tires and rims.
- Fisk Rubber Co., Chicopee Falls, Mass. (38 and 39)—Fisk tires and rims.
- Gabriel Horn Mfg. Co., Cleveland, O. (79)—Gabriel exhaust horns and rebound snubbers.
- Gemmer Mfg. Co., Detroit, Mich. (90)—Steering gears and parts.
- General Electric Co., Schenectady, N. Y. (115)—Cloth pinions, distributors and ignition specialties.
- Globe Machine & Stamping Co., Cleveland, O. (131)—Steel boxes for tools.
- Goodrich Co., B. F., Akron, Ohio (47 and 48)—Goodrich tires.
- Goodyear Tire & Rubber Co., Akron, Ohio (51 and 52)—Goodyear tires.
- Gray & Davis, Amesbury, Mass. (46)—Lamps and electric lighting system.
- Gray-Hawley Mfg. Co., Detroit, Mich. (127)—Exhaust horns and mufflers.
- Ham Mfg. Co., C. T., Rochester, N. Y. (4)—Lamps.
- Hardy Co., R. E., Chicago, Ill. (25)—Starite spark plugs.
- Harris Oil Co., A. W., Providence, R. I. (58)—Lubricants.
- Hartford Suspension Co., Jersey City, N. J. (59-60)—Truffault-Hartford shock absorbers, engine starters, jacks.
- Havoline Oil Co., New York City (91)—Lubricants.
- Haws, George A., New York City (114)—Panhard lubricants.
- Hawthorne Mfg. Co., Bridgeport, Conn. (113)—Old Sol lamps.
- Hays Mfg. Co., Detroit, Mich. (1)—Metal bodies and boxes.
- Heinz Electric Co., Lowell, Mass. (95)—Magnetos, coils and ignition devices.
- Hess Spring & Axle Co., Cincinnati, O. (144)—Hess axles and springs.
- Hoffecker Co., Boston, Mass. (133)—Speedometers and odometers.
- Hoffnung & Co., Ltd., S., New York City (18A)—Coventry chains and "Fastnut" lock washers.
- Horseless Age Co., New York City (1A)—Publications.
- Imperial Brass Mfg. Co., Chicago, Ill. (7)—Tire and other pumps, valves, cocks and fittings.
- International Acheson Graphite Co., Niagara Falls, N. Y. (119)—Oildag and Gre-dag lubricants.
- Johnson & Co., Isaac G., Spuyten Duyvil, N. Y. (77)—Forgings and castings.
- Jones Speedometer Co., New Rochelle, N. Y. (21)—Jones speedometers, odometers and recorders.
- Kellogg Mfg. Co., Rochester, N. Y. (151)—Kellogg hand and power air pumps.
- Keystone Lubricating Co., Philadelphia, Pa. (29A)—Keystone oils and greases.
- K-W Ignition Co., Cleveland, Ohio (25A)—Ignition devices.
- Kinsey Mfg. Co., Toledo, Ohio (5 & 5A)*—Kinwood windshields and parts.
- Kokomo Electric Co., Kokomo, Ind. (74)*—Kingston coils and timers.
- Leather Tire Goods Co., Niagara Falls, N. Y. (86)—Woodworth tire treads.
- Lee Tire & Rubber Co., Conshohocken, Pa. (101)—Jelco-Atlas puncture-proof tires and tubes.
- Lefever Arms Co., Syracuse, N. Y. (8A)—Transmissions.
- Leland & Co., W. H., Worcester, Mass. (84)*—
- Link Belt Co., Indianapolis, Ind. (89)—Chains.
- Longdin-Brugger Co., Fond du Lac, Wis. (86A)*—Automobile tops.
- Lovell-McConnell Mfg. Co., Newark, N. J. (97)—Klaxon horns, bumpers and Raiswell jacks.
- McCord Mfg. Co., Detroit, Mich. (36)—Radiators, lubricators, fans and gaskets.
- McCue Co., Buffalo, N. Y. (155)—Axles.
- Martel Blowout Protector Co., Chicago, Ill. (21b A)*—Emergency tire sleeves.
- Mayo Mfg. Co., Chicago, Ill. (10A)*—Automatic tire pumps.
- Michelin Tire Co., Milltown, N. J. (8 & 9)—Michelin tires.
- Model Gas Engine Co., Peru, Ind. (38A)*—Motors, transmissions, clutches.
- Morrison-Ricker Mfg. Co., Grinnell, Ia. (33A)—Grinnell gloves.
- Mosler & Co., A. R., New York City (37)—Soot-proof spark plugs.
- Mossberg Co., Frank, Attleboro, Mass. (31A)—Wrenches and belts.
- Motor, New York City (30A)—Publications.
- Motor Vehicle Pub. Co., New York City (12A)—Publications.
- Motz Clincher Tire & Rubber Co., Akron, O.—(2 and 3)—Motz cushion tires.
- Muncie Gear Works, Muncie, Ind. (85)—Wheels, gears, etc.
- National Carbon Co., Cleveland, O. (40)—Dry cells.
- National Coil Co., Lansing, Mich. (104)—Spark coils.
- National Motor Supply Co., Cleveland, O. (16A)—Supplies.
- National Tube Co., Pittsburgh, Pa. (50)—Shelby seamless steel tubing.
- New York & New Jersey Lubricants Co., New York City (20)—Columbia lubricants.
- Niagara Lead & Battery Co., Niagara Falls, N. Y. (585)—Storage batteries.
- Norton Grinding Co., Worcester, Mass. (82A)—Abrasive materials.
- Oliver Mfg. Co., Chicago, Ill. (70)—Peerless jacks.
- Pantasote Co., New York City (137)—Top and upholstering materials.
- Peck Wheel Co., Chicago, Ill. (23A)—Spring wheels.
- Pennsylvania Rubber Co., Jeanette, Pa. (12 and 13)—Pennsylvania and Polack tires.
- Perfection Spring Co., Cleveland, O. (6A)—Perfection automobile springs.
- Perfect Window Regulator Co., New York City (26A)—Window regulating devices.
- Piel Co., G., Long Island City, N. Y. (146)—Long horns.
- Pittsfield Spark Coil Co., Dalton, Mass. (64)—Pittsfield magnetos, jewel plugs and other ignition devices.
- Tingley, Charles O., Rahway, N. J. (3A)—Tire patches and vulcanizing outfits.
- Troy Carriage Sunshade Co., Troy, O. (37A)—Windshields and tops.
- Turner Brass Works, Sycamore, Ill. (103)—Portable brazing apparatus and tire pumps.
- United Rim Co., Akron, O. (112)—Standard Universal rims.
- United States Ball Bearing Co., Oak Park, Ill. (7A)—Ball bearings.
- United States Light and Heat Co., New York City (76A)—Storage batteries.
- United States Tire Co., New York City (43-45)—Hartford, G. & J., Morgan & Wright, Continental and United States tires.
- Remy Electric Co., Anderson, Ind. (14)—Remy magnetos and electric lighting systems.
- Republic Rubber Co., Youngstown, O. (30 and 3)—Republic tires.
- Rhineland Machine Works, New York City (13A)—Ball bearings.
- Ross Gear & Tool Co., Lafayette, Ind. (105)—Steering gears.
- Royal Equipment Co., Bridgeport, Conn. (9A)—Band brakes, Raybestos brake lining materials and Gyrex gasoline mixer.
- Sager Co., J. H., Rochester, N. Y. (535)—S. & S. shock absorbers.
- Selbach Rubber Co., Boston, Mass. (21A)—Tires.
- Shaler Co., C. A., Waupun, Wis. (136)—Steam and electric vulcanizers.
- Shawmut Tire Co., Boston, Mass. (39A)—Shawmut tires.

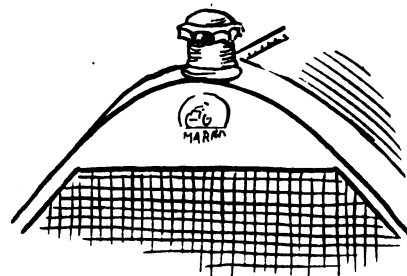
THERE IS DISTINCTIVENESS EVEN IN THE DESIGN OF RADIATOR CAPS



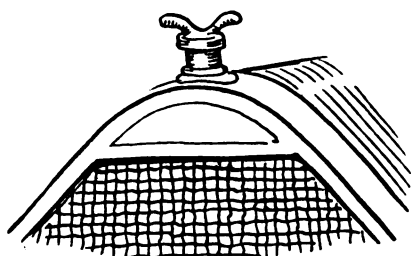
KING



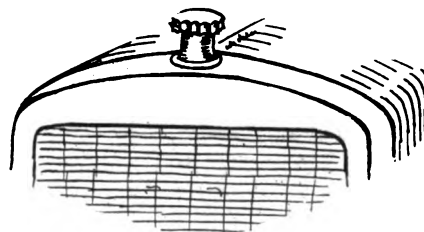
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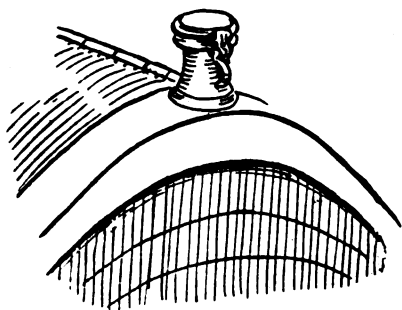
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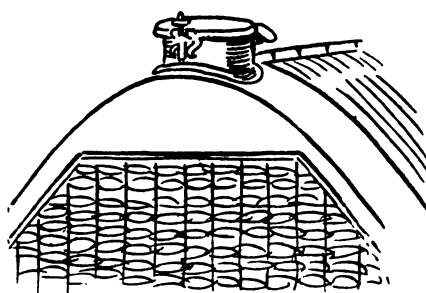
PENN "30"



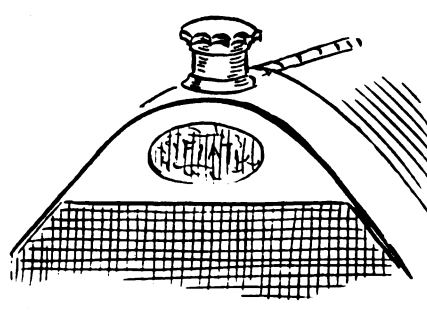
R. C. H.



RAMBLER



DE TANGLE



FIAT

Sheldon Axle Co., Wilkes-Barre, Pa. (22)—Axles and springs.
 Simms Magneto Co., New York City (122)—Simms magnetos.
 Smith Co., A. C., Milwaukee, Wis. (80)—Frames and parts.
 Sparks-Withington Co., Jackson, Mich. (100)—Fans, stampings and screw machine products.
 Spicer Mfg. Co., Plainfield, N. J. (63)—Spicer universal joints.
 Splitdorf, C. F., New York City (49)—Splitdorf magnetos and spark plugs.
 Sprague Umbrella Co., Norwalk, O. (138)—Tops and windshields.
 Standard Roller Bearing Co., Philadelphia, Pa. (5B)—Standard roller bearings.
 Standard Varnish Works, Chicago, Ill. (28A)—Varnishes.
 Standard Welding Co., Cleveland, O. (28)—Electrically welded tubing and parts.
 Start-Lite Co., Chicago, Ill. (140)—Lamp lighting systems.
 Stein Double Cushion Tire Co., Akron, O. (154)—Stein cushion tires.
 Stewart & Clark Mfg. Co., Chicago, Ill. (108)—Stewart speedometers.

Stromberg Motor Devices Co., Chicago, Ill. (76)—Stromberg carburetors.
 Stutz Auto Parts Co., Indianapolis, Ind. (111)—Parts.
 Swinehart Tire & Rubber Co., Akron, O. (15)—Swinehart tires.
 Timken Detroit Axle Co., Detroit, Mich. (32)—Axles.
 Timken Roller Bearing Co., Canton, O. (33)—Roller bearings.
 Universal Tire Protector Co., Angola, Ind. (142)—Tire protectors.
 Universal Wind Shield Co., Chicago, Ill. (146)—Windshields.
 Valentine & Co., New York City (125)—Varnishes.
 Veeder Mfg. Co., Hartford, Conn. (42)—Veeder tachometers and odometers.
 Vesta Accumulator Co., Chicago, Ill. (56)—Vesta lamps, generators and accumulators.
 Vorhees Rubber Mfg. Co., Jersey City, N. J. (81)—Inner tubes and patches.
 Warner Gear Co., Muncie, Ind. (11)—Gears and parts.
 Warner Instrument Co., Beloit, Wis. (124)—Warner autometers.

Warner Mfg. Co., Toledo, O. (102)—Transmissions and steering gears.
 Waukesha Motor Co., Waukesha, Wis. (118)—Motors.
 Weed Chain Tire Grip Co., New York City (22)—Weed tire chains.
 Weston-Mott Co., Flint, Mich. (66)—Transmissions and axles.
 Western Motor Car, Marion, Ind. (123)—Rutenber motors.
 Wheeler & Schebler Co., Indianapolis, Ind. (17)—Schebler carburetors and magnetos.
 Western Tool & Forge Co., Brackenridge, Pa. (152)—Forgings and tools.
 Whitney Mfg. Co., Hartford, Conn. (23)—Whitney chains.
 Willard Storage Battery Co., Cleveland, O. (150)—Elba lighting outfits.
 Williams & Co., J. H., Brooklyn, N. Y. (57)—Forgings and tools.
 Wisconsin Motor Mfg. Co., Milwaukee, Wis. (17A)—Motors.
 Wolverine Lubricants Co., New York City (148)—Lubricants.

SOUTHERN GARDEN AT PROVIDENCE

Azure Sky and Winding Paths Carry Out Illusion at First Dealers' Show—Exhibitors Number 86.

Under the azure sky of a well-cared-for Southern garden, surrounded by massive palms, 51 different makes of pleasure vehicles, and 12 commercial cars were placed on public exhibition when the Rhode Island Licensed Automobile Dealers' Association's first automobile show opened in the Providence State Armory on Monday evening last, the 22nd inst.

True, the azure sky as well as most of the appointments of the garden are but examples of the decorative artists' handiwork, but the effect produced by the hundreds of electric lights, the numerous winding paths, and the lattice partitions, which, laden with blossoms, have been erected to separate the different exhibits, are none the less attractive. The garden will continue in full bloom until January 27th.

A monopoly of the basement by the 20 accessory dealers is averted by the addition of a few vehicle exhibits made necessary by the limited area of the drill hall. Among the exhibitors are the Higgins Motor Car Co., Stearn-Knight; Foss-Hughes Motor Car Co., Pierce-Arrow; Aetna Bottle & Stopper Co., Buick; Providence Motor Car Co., Stoddard-Dayton; Speedwell Co., Speedwell Rhode Island Motor Car Co., Pope Hartford; Arthur S. Lee, Corbin; C. H. Goodwin, Inter-State; the William Hughes Co., Reo and Reo trucks; Alvin P. Fuller, Packard and Packard trucks; J. S. Harrington & Co., Everitt and Thomas; Mitchell Auto Co., Mitchell; Davis Automobile Co., Peerless, Winton, Locomobile and Gramm trucks; L. B. Lorimer, Hudson; John O'Donnell, Premier; Maxwell Sales Co., Maxwell; Kissel Kar Co., Kissel; Fiat Automobile Co., of Rhode Island, Fiat; Hitchcock-Banks Motor Car Co., Knox and Knox trucks; Cadillac Auto Co., of Rhode Island, Cadillac; White, Binford & Robinson Motor Co., White and White trucks; the Peleg Brown Co., Oakland; Pugh Bros., National, Overland, Marion, American, Palmer-Singer, Metz, and Morgan trucks; J. J. Nugent, Cartercar; E. E. Whipple, R. C. H.; Nock Auto Co., Lexington and Warren; K. Bostel, Baker; E. A. Dauer, Haynes; Marmon Motor Car Co., Marmon; Frank J. McCaw Co., Steven-Duryea; Pawtucket Automobile Co., E-M-F, Flanders and Garford; Stanley Motor Carriage Co., Stanley; Davis Automobile Co., Chalmers; Capitol Motor Car Co., Hupmobile; W. A. Wilcox, Franklin; Whitten Motor Vehicle Co., Abbott-Detroit and Brush; American Locomotive Co., Alco trucks; Teel Mfg. Co., Teel-Woodworth trucks; R. G. Davis & Charles Barre, Lenox; Autocar Sales & Service Co., Autocar;

North End Garage, Elmore and Chase trucks; B. A. Swenson, Indian Motorcycles; Elmwood Cyclery, Harley-Davidson motorcycles; H. G. Baxter, Excelsior motorcycles.

Federal Registration Bill Reintroduced.

Undismayed by previous failures, and following the American Automobile Association Federal aid convention, which occurred in Washington last week, the A. A. A. Federal registration bill was reintroduced in the House on Tuesday, 23d inst., Representative Volsted of Minnesota standing sponsor for it. In common with other automobile associations the National Association of Automobile Manufacturers has been lending its assistance in support of the measure, and though there has been considerable question as to its constitutionality, at the annual meeting last week it was brought out by the legislative committee of that body, composed of Albert L. Pope, Benjamin Briscoe and Charles Clifton, that the much-mooted 'unconstitutionality of the bill has been effectually disposed of. The sum and substance of the report of the legislative committee was that the measure has answered every argument based on expediency and that every suggestion based on unconstitutionality, and that it now stands approved by the five lawyers appointed as a sub-committee by the interstate and foreign commerce committee of the larger of the two houses of Congress. Not only have the constitutional objections been overcome by argument before the sub-committee of the interstate and foreign commerce committee and before the complete committee, it is pointed out, but the Attorney-General of the United States has written what is an ideal opinion of a legal adviser, in brevity, conciseness and clarity and one which is a clear vindication of all the efforts which have been put forth in behalf of the bill, which seeks simply to provide one registration tag which will be recognized and accepted by every State in the Union.

Carbide Killed Fish; Motorist Has to Pay.

A most remarkable case of liability for heavy damages was decided last month in Munich, Bavaria. The chauffeur of a touring car, nearing the Bavarian capital, crossed a small creek, in which very fine fish were kept by a fancier. Needing a new charge of calcium carbide for his acetylene generator he stepped to the edge of the creek and emptied the remainder of the old carbide in the generator into the water and proceeded on his way. Within the next hour or so several hundred of the finest fish in the creek died from poisoning and the cause was traced to the old carbide, which in the creek had developed sufficient acetylene and phosphor-hydrogen to kill the fish. The owner of the car had to pay heavy damages, and the various German touring clubs are directing attention to the case as a warning to other motorists.

ROCHESTER SHOW WHITE AND GOLD

Myriad Lights and Immense Sunburst Transform Armory Into Electric Palace—The 70 Who Exhibited.

Shimmering in every nook and corner with the glare of thousands of incandescents, turning back from the walls and lofty ceiling a flood of harmony toned and enriched by the immensity of its space, the Rochester State Armory was a veritable electric palace at the opening of the fourth annual show of the Rochester Automobile Dealers' Association on Monday last the 22nd of January.

Not an inch of the vast ceiling is visible. Thousands of yards of white and gold bunting draped artistically from wall to wall, the intersections being hidden by huge folds of gaily colored fabric, form an effective background for the myriad lights. The crowning feature of the whole decorative scheme is an immense sunburst in the colors of the rainbow, which is the first object to catch the eye of the visitor. On either side below the galleries long rows of glimmering crescents and wreaths stretch entirely around the immense enclosure.

The 70 exhibitors of pleasure or commercial vehicles, parts and accessories are as follows: Babcock Electric Garage & Sales Co.; Ball-Washburn Motor Co.; Genesee Motor Co.; James Cunningham Son & Co.; John Cunningham; Elliot-Porschett Co.; Empire State General Vehicle Co.; Franklin Auto Co.; E. W. Fisher; Gillis-Baird Co.; Gabel-Hill Co.; A. V. Hart; C. E. Hartson; Jenkins Motor Car Co.; M. R. Kondolf; Kline Motor Car Co.; F. R. Luescher; Mandery Motor Car Co.; McKenny & Gillpin; Mabbett-Bettys Motor Car Co.; D. L. McGuire & Bro.; Arthur McNall; Thomas J. Northway; Overland-Rochester Co.; Peck & Arnold; Hollis-Rand Co.; Strong-Crittenden Co.; F. C. Schutt; Chas. E. Sager; Sullivan Motor Car Co.; Robert Thompson; C. L. Whiting; A. M. Zimbrich; LeHardy & Lindsay; Baker Bros. Motor Co.; Kate & Pawlik; William H. Wilson Iron Works; Auto Commercial Co.; W. H. Rowdink & Son; Wayne Oil Tank and Pump Co.; Union Oil Co.; William A. Lane; American Garage; Auburn Motor Car Co.; Elter Sales Co.; Case Car Co.; Philadelphia Storage Battery Co.; New York Auto Tire & Supply Co.; Maecherlein, Bloss & Co.; Edward Rabe; American Oil and Lubricant Co.; A. R. Yells; Burger & Cox Motor Co.; C. E. & H. B. Clark; Abbott-Detroit Sales Co.; Rochester Rubber Co.; Moore & Mills; French-Miller Mfg. Co.; J. A. Laurer; R. J. Stowe; Rochester Accessory Co.; Beers Bros. Thermostat Co.; Rochester Auto Supply Co.; Sterling Co.; Puritan Soap Co.; Richmond Sales Co.; Marathon Sales Co.; Automobile Trade Journal.

DIFFERENTIAL WITH TWO DRIVES

How Lancia and Evans Solve Problem of Placing Two "Direct" Drives in Rear Axle Mechanism.

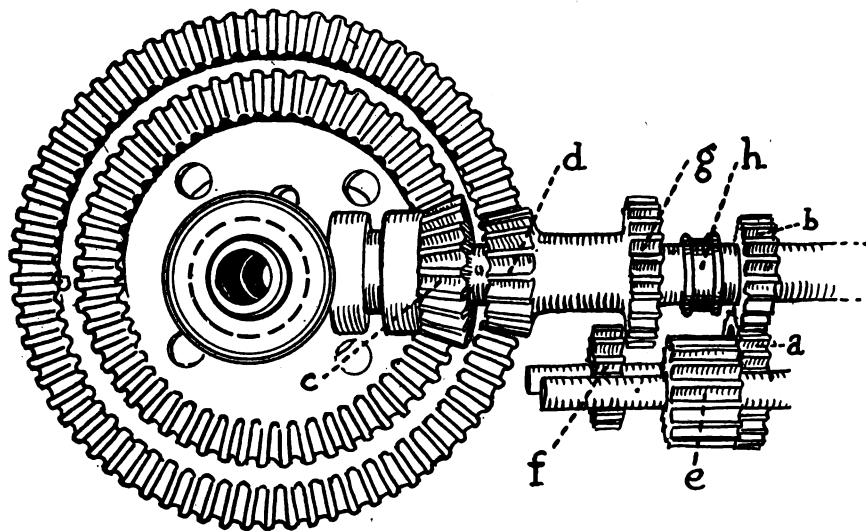
Though the problem of producing a satisfactory combined rear axle, differential and change speed mechanism in which more than one "direct" drive is obtainable is not one which lends itself readily to solu-

other gears in addition to the bevel drive must be used. Briefly, the purpose of any mechanism which provides more than one so-called "direct" drive is to eliminate some of the small gears in the change speed mechanism, which operate at comparatively high speed, and thus tend to produce noise and to absorb power.

Though numerous attempts previously had been made to produce an efficient mechanism of this type it was not until some three years ago that a satisfactory one

As may be seen by the accompanying illustrations which show the new Lancia transmission and the older Evans mechanism, the latter being the product of the Merchant & Evans Co., of Philadelphia, well-known as the American producer of the Hele-Shaw clutch and sundry other specialties, these two systems are quite similar in general design. In fact it is stated by the Merchant & Evans Co. that the Lancia mechanism is but a copy of the Evans axle. However, though the two are quite similar in other respects they differ in that the Evans mechanism provides three speeds forward and reverse, low speed and reverse only being obtained through spur gearing, while the Lancia provides four speeds forward and reverse, the two higher speeds being "direct" drive. It also differs from the Evans axle in that the lay shaft is idle except when first second or reverse gears are in use.

The Evans mechanism consists of two pairs of bevel pinions and drive wheels combined in a unit with the differential and the several spur gears which are used in obtaining low speed and reverse. Second and third speeds, which are so-called "direct" drives, are obtained by a clutching device which operates through a shifter, h, to connect either the pinion d to the straight-through shaft for second speed, or the pinion c for third or high speed. First speed is obtained by meshing the gear f on the lay shaft with the gear g, the connection between the straight-through shaft and the pinion d having been broken. The drive then is through the constantly meshed lay-shaft gear a and back to the bevel



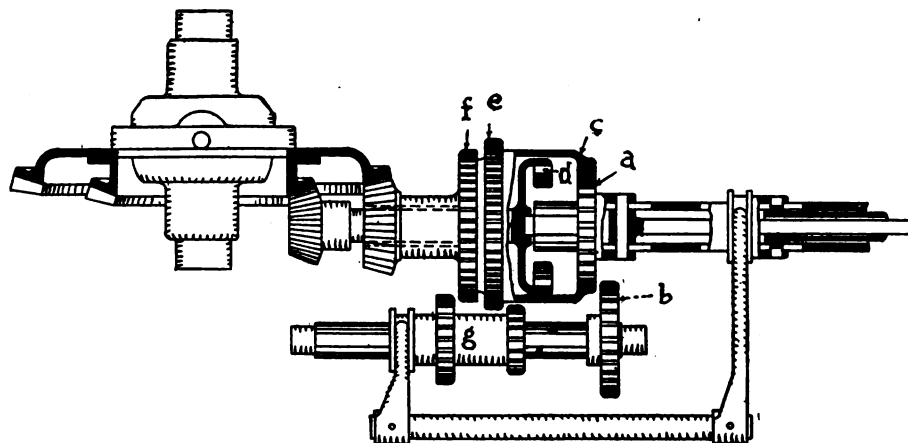
EVANS REAR CONSTRUCTION WHICH PROVIDES TWO "DIRECT" DRIVES

tion, persistent effort on the part of engineers has resulted in the evolution of several types which suggest each other not a little, but which nevertheless are quite different in the application of the same principle. Which is to say, that of the three types which are most widely known all employ double bevel drive gears and pinions arranged tandem, and thus provide two "direct" drives.

Strictly speaking, however, "direct" drive is a misnomer. There is no such thing as "direct" drive, though the term is common enough in automobile parlance. As it generally is understood, it means that the engine drives the rear wheels only through the bevel gear and pinion, there being no other gears in use. It is understood, of course, that the pinions in the differential are excepted for they do not transmit power unless one of the drive wheels rotates slower than the other, as, for instance, when the car is rounding a corner. Direct drive in its true sense would mean that the engine is direct connected to the rear wheels.

Naturally, every one who is even remotely acquainted with the mechanism of a car knows that this is not so—that between the engine and the rear axle there is a bevel gear wheel and pinion to transmit the power around a corner, so to speak, and also to lower the ratio of engine revolutions to rear wheel revolutions. Similarly, it scarcely is necessary to point out that when still lower gear ratios are required

was placed on the market. This was the Evans combined rear axle and change gear mechanism and though little has been heard of it in the interim it is in use on a num-



LANCIA ARRANGEMENT—TWO "DIRECT" DRIVES AND FOUR SPEEDS

ber of commercial vehicles, and also is being used to some extent for pleasure cars. The Collins rear axle was the next to make its appearance. It was introduced a little over a year ago, at which time it was described and illustrated in the Motor World. By way of refreshing the memories of those who may perhaps have forgotten it, it might be added that the Collins axle provides two speeds forward, both of which are "direct" drives. The latest device of the kind to make its appearance is in use on Lancia cars which are of Italian origin.

pinion d through the gears f and g. The reverse movement is obtained by sliding the wide gear e into mesh with both f and g when the drive is transmitted through the bevel pinion d. The lay shaft with its pinions is constantly in motion.

In the Lancia mechanism, the arrangement of the double bevel drives is quite similar though the rest of the system is different. The drive shaft is tubular and contains a rod by means of which the gear a is moved, the outside of the rod being a tube (shown in black section) which con-

trols the sliding sleeve on the lay shaft. This rod and tube are controlled by means of collars at the forward end of the propeller shaft. When the control lever is in the neutral position the gear a is in mesh with b so that the engine rotation is transmitted to the lay shaft. Sliding the sleeve g then gives first speed through e and second speed through f, both of these gears being made solid with the larger bevel pinion. When the gear g is moved still further back it picks up a reverse pinion similar to g but in constant mesh with e; this is not shown in the illustration.

For third speed ahead, simple movement of the pinion a into mesh with the internally toothed ring c, in which position it is shown, suffices, for the ring c is integral with the larger driving pinion. Movement of the gear a further back brings it into mesh with the internally toothed ring d which is integral with the smaller bevel pinion, and thus gives fourth or high speed ahead.

Obviously, the Evans axle is infinitely simpler than the Lancia mechanism; though this might be expected by reason of the fact that the former provides three speeds ahead and the latter provides four. Though the advantage of a stationary lay shaft has been pointed out on more than one occasion, and several manufacturers have succeeded in producing change gear mechanisms of this character it is open to question whether it really is as advantageous as might be supposed. Present-day gear boxes in which the lay shaft and its pinions are in constant motion are giving entire satisfaction. There apparently is no reason for introducing the complication necessary to permit the lay shaft to remain idle except when the lower gear ratios are used, to say nothing of the added skill which is necessary in operating such a mechanism.

Knight Delivering Lectures in Many Cities.

Under the auspices of the F. B. Stearns Co., of Cleveland, and under the personal guidance of H. H. Hower, the Stearns publicity manager, Charles Y. Knight, inventor of the Knight sleeve valve engine, has undertaken a four weeks' illustrated lecture tour which will reach as far west as Denver. Knight already has spoken in Philadelphia, Cleveland and Detroit, and in turn will visit Chicago, Indianapolis, Cincinnati, Minneapolis, St. Louis, and several other middle-west cities. Having completed his western circuit, Knight will deliver his lecture, which, of course, deals with the Knight engine, in Buffalo, Albany, Boston, Worcester and other New England cities. When his lecture tour is completed, Knight will return to England, where he now makes his home and, according to Press Agent Hower, will take with him a chassis of the Stearns-Knight car, Mr. Knight presumably having secured the necessary dispensation from his foreign licensees whose contracts forbid the importation of Knight engine cars made in the United States.

COMMON STOCK TO BE "NON PAR"

Far-Reaching New York Law to Check "Paper" Companies—Directors Individually Responsible for Debts.

Automobile companies and all other companies founded on "expectations" will find it exceedingly difficult to dispose of common stock in the State of New York after a bill which just has been introduced into the legislature and which is practically certain to become a law, goes into effect. The bill, which has been drawn up by the Committee on Corporation Law of the New York Bar Association and which has the support of the Federal Government, the Federal Railroad Securities Commission and the New York Public Service Commission, provides that no share of common stock of any industrial enterprise shall be given a par value, but shall solely represent a pro rata share in the profits of said enterprise and a similar share in the assets of the company, should it be decided to dissolve the latter. The terms "\$100," or "\$10," or "\$1,000" in connection with common stock are forbidden by the proposed law.

The bill stipulates that preferred stock shall have a par value of \$5 or multiples of \$5, up to \$100, which may not be exceeded. In addition to such preferred stock the issuance of non-par stock is provided for. "Each share of such stock without nominal or par value shall be equal to every other share of such stock, subject to the preferences given to the preferred stock (if any) authorized to be issued. Every such certificate for such shares without nominal or par value shall have plainly written or printed upon its face the number of such shares which the corporation is authorized to issue, and no such certificates shall express any nominal or par value of such shares.

"The certificates for preferred shares having a preference as to principal may state the amount which the holders of such preferred shares shall be entitled to receive on account of principal from the surplus assets of the corporation in preference to the holders of other shares, and may state any other rights or preferences given to the holders of such shares."

The requirements designed to prevent watering are rigid, and it is specifically provided that no corporation shall begin business or incur any debts until "the amount of capital stated in its certificate of incorporation shall have been fully paid in money or in property taken at its actual value."

It goes further, providing that if capital increases are made a corporation's indebtedness may be increased until the new capital is paid up. The liabilities of directors are made particularly stringent. As to directors the bill provides:

"The directors of the corporation assenting to the creation of any debt in violation of this section shall be liable jointly and severally for such debt; but no action shall be brought under the foregoing provision of this section unless within one year after the debt shall have been incurred the creditors shall have served upon the director written notice of intention to hold him personally liable for such debt. Any director who, because of any such liability under this section, shall pay any debt of the corporation, shall be subrogated to all rights of the creditor in respect thereof against the corporation and its property and also shall be entitled to contribution from all other directors of the corporation similarly liable for the same debt and the personal representative of any such director who shall have died before making such contribution."

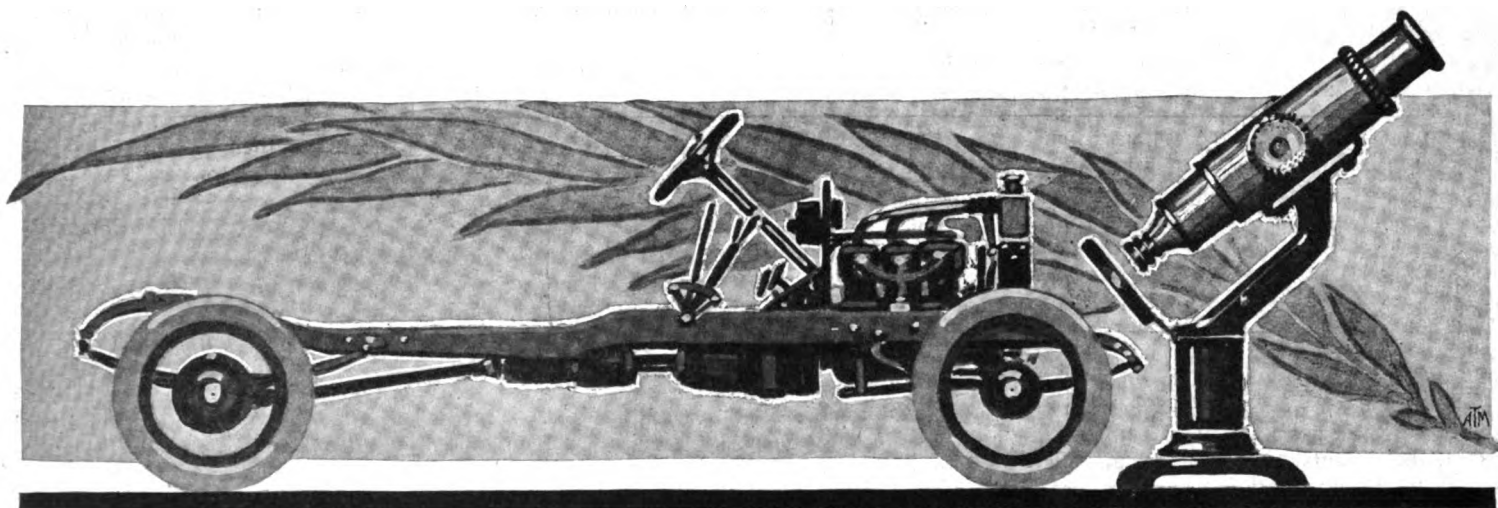
It is specifically forbidden to declare a dividend which will reduce the amount of the capital stated in the certificate as the amount with which the corporation will carry on business, and full liability for the losses due to the unlawful dividend is imposed on the directors responsible for its declaration. This responsibility holds the guilty directors jointly and severally liable to the corporation and to its creditors "to the full amount of any loss sustained by such corporation or by its creditors respectively by reason of such dividend."

Hupmobile "Export Expedition" Is Ended.

The world-touring Hupmobile is back in Detroit again, and its three occupants have "a tale to tell"—as the saying goes. Joseph R. Drake, secretary of the Hupp Motor Car Co., of Detroit; Tom Hanlon, mechanical expert, and Tom Jones, the "official chronicler" of the tour, are being congratulated by their friends for having covered over 40,000 miles in zig-zag journey, of which 27,000 miles were actually traveled by "Hupmobile" power over roads and near-roads in five continents. Their entry into Detroit on Wednesday, the 24th inst., was accompanied by speechmaking, music and hilarity, and the little car formed one of the main attractions at the automobile show at present being held in Detroit.

The long trip began on November 4, 1910, with their departure for Chicago, continued via Denver, San Francisco, Honolulu, Sydney, Melbourne, New Zealand, the Philippines, Japan, China, India, Egypt, the Mediterranean countries, Germany, France, Holland and England, back to America. New York was reached on January 15th, and the Hupmobile exhibited in Grand Central Palace, to be gazed on by the thousands of visitors to the N. A. A. M. show.

During the long trip, which often was referred to as the "Hupmobile Export Expedition," the members of the party gave demonstrations and placed agencies wherever the interest of the people seemed to warrant it.



“Refinement of Details;” Its Full Meaning

Much-Used Term That Contains Much More Significance Than It Usually Conveys—Some of the Many Small But Far-reaching Improvements Styled “Refinements” and the Large Contributions They Make to Efficiency, Comfort and Satisfaction.

There is one note more dominant than all others which every year at about this time becomes apparent. In fact, it is more than a note; it is a whole theme in itself, and it is well-defined. Clearly perceptible, it ran through both of the two big shows which just have been brought to a close, and few there were who failed to mark it. But it is not confined to the shows alone—it is in the very air, so to speak, and is encompassed in the three words, “refinement of detail.”

It is not new of course; refinement of detail has been going on for years, but never before has it been quite so prominent. That this is due to the fact that manufacturing practice has become standardized to a greater extent within the past year or so it scarcely is necessary to add; it is perfectly obvious. Years ago radicalism was looked for—was expected—and though it still is looked for the failure to find it scarcely engenders disappointment. Instead, standard products with the rough edges smoothed away are looked for. Outside appearances change but little from year to year. But, though cars may remain unaltered to the casual observer, deep down in their vitals, troublesome, if unobtrusive, details are improved materially and the inevitable result is that the action of the individual car is distinctly better, either by reason of greater power, greater smoothness or greater ease of control. Without going deeper into the matter, it is direct evidence that manufacturers are paying greater attention to the little things than ever before.

Just what the bare statement “refinement of detail” may mean depends entirely on the

particular car, or line of cars, to which it is applied, but the broadest interpretation which can be given it, and the one which fits all the best is embraced in a general simplification of the whole mechanism of the car. And in this simplifying process nothing has been deemed too small or too inconspicuous for careful attention. Things which heretofore have received the scantiest notice, if indeed they have received any at all—which is not to be wondered at in view of the great number of parts makers and the use of parts made in factories other than those in which the greatest portion of the finished car is made—now are pounced upon by the manufacturer and the edict goes forth. “Smooth it—simplify it.”

In obtaining simplicity, to quote a prominent engineer, “there are two competing schools, a school of those who contend for simplicity at all costs, and a school of those who claim that it is best first to achieve a desired result and then to simplify the method of attaining it after it has been reached.” So excellent is the reaction of these two schools one on the other that it is practically impossible to prefer either. Still there is an element of courage and radicalism about the second that attracts those who have the initiative. It is the school of progress, of trial, and, it must be added, of repeated error and correction.

But while the doings of the first school are of unquestioned interest, its scholars are in the minority, at present at least, and chief interest centers around the doings of their second school for they exemplify the best present day practice. Which is to say, that manufacturers, having achieved a desired result, have been very busy simpli-

fying the method of attaining it. The result is the paramount “refinement of detail” about which so much is heard.

Granting that the motor in a car is one of its principal parts, if not the principal part, it is but natural that considerable attention should be devoted to it. Refinement of detail in this case may mean almost literally that corners have been smoothed down with a big file. Not a few of the latest motors suggest just such treatment in their symmetrical rounded shapes, but of course the method of attaining the result has not included the use of a file. Rather, the designs have been refined. Perhaps the rounding of corners appears a very little matter, but at least it tends to show that not even the smallest matters now are overlooked. Actually, such treatment makes for simplicity.

Perhaps this general rounding off and smoothing down is most apparent in the block motors which lately have come into much greater use than ever before. And block casting itself is largely a refinement of detail; it indicates no change of principle and in the majority of cases no change of power; it is merely a simplified method of casting all the cylinders in a single block instead of casting them in four or six units as the case may be. Of course, block casting is not new—this method of construction has been common for years, but it is only recently that it has sprung into prominence, and has gained the popularity which it justly deserves. But though the casting of four or six cylinders in a single block scarcely is new, there is one little detail of the method which is new, comparatively speaking, and that is the casting

of water, exhaust and intake passages integral with the cylinder block. This is another refinement of detail that points directly at simplicity for at one fell swoop a number of pipes and joints and fastenings which hitherto have been thought indispensable have been eliminated. It is perhaps needless to add that the result acts directly to benefit the ultimate consumer not only for the reason that the whole motor is greatly simplified, but also for the reason that cost of manufacture is reduced.

It has been said that the introduction of the Knight engine and other engines of somewhat similar description in which the usual poppet valves are replaced by sleeves or other devices has had a most direct effect on the manufacturers of poppet valve engines in the stimulation which has been given the movement for silence. That there is some truth in the statement is evidenced by this year's crop of poppet valve motors, though it is open to question whether manufacturers would not in time have put forth the effort for silence which now is apparent, without the stimulus which originated largely abroad. Valve mechanisms always have proven a prolific source of noise and as the noise itself is an indication of lost motion and it follows that lost motion means lost power, manufacturers readily have turned to this part of their productions as being susceptible of refinement. Perhaps the most noticeable treatment, which also may be classed as a refinement of detail, is the enclosing of valves and springs by means of metal covers. From an engineering point of view this method is dead wrong if the covers are merely for the purpose of quieting the moving parts. Covering the stems and springs and tappets does not eliminate the noise, it merely deadens it, as, of course, is fairly well known. But the covers do keep out dirt and dust, and therefore eliminate much of the wear which ordinarily would take place, and if the valve parts have been refined, and it is only fair to add that in the majority of cases they have, then the silence which is obtained is retained for long periods. When the valves eventually do become a little noisier than usual then there becomes apparent another of the little refinements which everywhere are evident. This is embraced in provision for adjusting the tappets. The bigger and more expensive cars, that is, most of them, have had adjustable valve tappets for several years, but on many of the moderate-priced cars, and in fact on some of the really low-priced cars this is a brand new feature, and one which commends itself as being most desirable. In several cases fiber tappets now are used where metal was used before, and in this way silence has been increased materially. In other cases, small springs maintain the tappets and the valve stems in constant contact so that there is no possibility of noise. But the principal feature is that in but very few instances have manufacturers failed to make provision for adjustment for natural wear. Barring

the silence which is obtained, it goes without saying that efficiency is increased by reason of more accurate timing of the valves.

Another of the refinements which really gave first indication of its increasing popularity last year is the use of spiral or helical gears in the timing gear train. Last year quite a few manufacturers changed over from spur to spiral gears, but this year the number is almost double. To those who are familiar with automobile construction it is not necessary to point out that the use of spiral gears materially lessens the noise which usually emanates from motors. Similarly, it will not be necessary to point out that efficiency is increased by their use.

Of the making of carburettors it might almost be said there is no end. But whereas a few years ago carburettors with but a single jet were the rule, there now is a strong tendency toward two jets or three, and many of the cheaper cars which heretofore were equipped with single jet instruments now are equipped with carburettors having double jets. This scarcely may be classed as a refinement of detail of course, that is if the carburettor alone is viewed, for in that case it means new design throughout. But when the car is viewed in the concrete it really is a refinement of detail for none of the other essential parts of the car have been changed. Efforts to obtain a greater degree of silence also are revealed in the addition of long hot-air intake pipes in a great many cases, the effect being to subdue the constant hissing caused by the intruding air. In Stoddard-Dayton cars such an intake takes the form of a long passage cored in the cylinder casting. Dash adjustments, too, are a refinement which now is fairly common.

Since the edict went forth from the law makers that smoking automobiles would not be tolerated in the larger cities manufacturers have turned with greater avidity to the problem of refining lubricating systems with a view to abating the smoke nuisance. The splash system alone never has been entirely satisfactory. Not that it failed of its purpose in lubricating the internal moving parts of an engine, but simply for the reason that it was practically impossible to eliminate smoking. Hence numerous refinements in the way of skillfully located baffle plates now are used, and not a few manufacturers have turned almost completely away from the splash system and have embraced the force feed system in which the oil is pumped through a hollow crankshaft whence it drains into a sump and is recirculated. Not only does this system provide efficient lubrication, and at the same time practically eliminate the possibility of smoking, but it permits the incorporation of another excellent feature in the lubrication of the timing gear train from the engine oiling system. Some manufacturers have carried the refinement of their lubrication systems even further, and

prominent among them is the Chalmers company which has evolved a brand new and exclusive type of piston ring which it is claimed effectually prevents smoking without interfering with the proper lubrication of the cylinders. Other manufacturers have adopted concentric piston rings in place of the eccentric rings which have been used almost from time immemorial. Concentric rings, it might be explained in passing, reduce the amount of wear on the cylinder walls for the reason that the pressure exerted by them on the walls is considerably less than it is with the older style of eccentric rings. Incidentally the concentric rings fit the grooves all the way around and therefore there is no space for the accumulation of soot and oil.

Probably the greatest refinement which has been made in clutch design in general lies in the adoption of clutch brakes. Several well-known brands of cars, such, for instance as the Pierce-Arrow, which never before have been equipped with clutch brakes now have them. They are a refinement of clutch design, of course, and the mere fact that they now are used more extensively than they have been in the past is evidence sufficient of their value in increasing the smoothness of action of a car. Cork inserts, too, are another refinement which a number of manufacturers feature for the first time this year.

In change gear mechanism there is little refinement that appears on the surface. Due to the increasing popularity of center control a great number of gear boxes now are so made that levers may be mounted for either left hand or right hand control, but though this scarcely can be termed a refinement of detail, it is nevertheless inasmuch as it is practically a better arrangement of component parts—an arrangement which tends to simplify construction and operation. Rather, that refinement which has been made is deeper down and is embraced principally in better finish of gears, the use of better materials and in some cases slight changes in the width of gear faces and in the form and pitch of the gear teeth. All of which, of course, make for greater efficiency. The change gear mechanism, too, is another part which has been more or less prolific of noise, which it is not always easy to subdue. Several manufacturers have solved the problem by using spiral gears to drive the lay shaft, and in this way have contributed materially to the silent operation of their products.

Refinements pertaining to rear axles are of varied character, though in many cases they principally have to do with a general strengthening of the structure without increasing weight. Thus, for instance, quite a number of manufacturers now are using pressed steel housings instead of cast housings as heretofore. In fact, weight has been reduced in some cases which conduces to greater efficiency. Methods of lubricating the differential and driving pinions also

have come in for some refinement evidenced by the presence on some cars of an oil pipe from the engine lubricating system. Other axles now are fitted with inspection covers which are held in place by means of thumb screws or spring latches instead of the several bolts and nuts used in the past. In Oldsmobiles, for instance, the annoyance of oil in the brakes is obviated by placing drain cocks at the outer ends of the axles so that excess oil is drained out onto the road instead of finding its way into the brakes.

With but very few exceptions wheels and tires have been increased in size, and as one of the sure indications that not even the smallest and most obscure things have been overlooked it is interesting to note that in not a few cases even wheel spokes have been increased in size to provide a greater factor of safety. Similarly, it is possible to go right through any average chassis and pick out at random hundreds of refinements which according to the printed word of the manufacturer are "minor" but which really are not minor, strictly speaking. They are of vital importance; and though it has been said that no manufacturer cares to have it known that quite a number of such "minor" changes have been made in his product on the ground that it may influence the belief that previous products were not all that might be expected, there is another side to the question. The purchaser is entitled to know and surely no right-minded person can possibly misconstrue the action of a manufacturer who actually betters his product—and at no extra cost to the purchaser.

But not all the refinements that have been made can be put under the head "Mechanical Refinements." Bodies, too, have received their share of attention. Perhaps they reflect it most in the more perfect blending of skuttle dash and high-sided bodies, and the more judicious disposition of the miscellaneous trappings which go to make up a completely equipped car. Bodies are roomier than ever before and they are more comfortable; cushions are thicker, as for instance in the Locomobile and Palmer-Singer cars in which they are 10 inches thick, and greater attention is paid to obtaining a more restful angle of both seats and backs.

The makers of two other well known brands of car at least, namely, Stoddard-Dayton and King, have further increased the comfort of passengers by providing seats that may be adjusted backward and forward within certain limits, and on other makes of cars auxiliary seats are made to fold up out of sight, while on many others, provision is made for convenient storage of tools, spare tires, side curtains, and what-not that renders it unnecessary to disturb the passengers when such things are required.

Despite the apparent radicalism in the location of control levers in the center of the footboard even this move can, without fear

of contradiction, be styled a refinement of detail. It is one of the big refinements that scarcely can be overlooked by even the casual observer. In the opinion of not a few prominent individuals connected with the automobile industry, the center of the footboard is the logical position for the control levers, for it leaves both front doors free. It is not unreasonable to expect that next year even a greater number of manufacturers will have made this particular refinement, or at least they will have followed the example of several other manufacturers this year who offered the option of either side or center control.

Ventilators, of course, are really a refinement. When closed front cars were first placed on the market nobody gave the slightest thought to the ventilation, but now there is scarcely a car that is put out that is minus these necessary adjuncts. Similarly, heaters now are standard equipment on several cars, the favorite method of obtaining the increase of temperature in the region of the passengers' pedal extremities being by means of hot air from the engine compartment.

The comfort of passengers has been looked after in other ways, too, as, for instance, in the location of the gasoline tank filler on Marion cars between the two front seats in a tiny locker for the purpose. Thomas tanks have been removed bodily from the usual place under the front seats, or under the rear axle, and now occupy a place under the tonneau where they are out of the way; they are filled by means of pipes which lead to filler caps in the floor of the tonneau. Both of these instances are merely refinements—refinements that tend to simplify the operation of the car and materially increase the comfort of passengers.

Naturally, such refinement has been going on ever since the first automobile rolled over the roads, and it will go on probably forever. For nothing can be expected to be perfect on its first trial, and despite elaborate tests made at the factories parts are subjected to strains and made to do work in the hands of the owner that cannot be forecast by the designer or the factory tester. And besides, there always is going on a great amount of experimental work, and there always is being evolved newer and better ways of producing and assembling. It is but logical therefore, that there should be each year a liberal exhibit of that evidence of progress which is styled "Refinement of Detail."

Statistics of London's Traffic Accidents.

According to the statistics made public by the authorities of London, accidents due to automobiles are on the increase, although not in proportion to the great increase of this type of vehicle. Motor buses, which in the British capital are about as numerous as street railway cars, have been responsible for 116 deaths during the year 1910, while 108 were killed by all other

kinds of automobiles and motor trucks. The trolley cars, however, furnished the greatest quota of all motor propelled vehicles, no less than 350 deaths being attributed to them. Horse vehicles, on account of their far greater number, naturally caused a much larger number of accidents, fully 874 resulting fatally. During 1910 of the 17,560 persons injured by vehicles in the streets of London, motor cabs injured 1,818, motor trams 2,372, motor omnibuses 1,008, uncovered motor cars 1,187, covered motor cars 804 and motorcycles 349.

The total number of persons injured by cabs other than motor cabs in 1910 was 506. The horse trams injured 66, the horse omnibuses 164 and carts and vans 4,233. In 1901 and 1902 only one person was killed in London by a motor car. In 1903 two persons were killed. In 1904 and 1905 the number rose to 11, in 1906 to 19 and in 1907 to 57. After 1907 the use of petrol driven vehicles became so general that the accidents arising from these rapidly grew in number, while the accidents due to other kinds of vehicles correspondingly fell off rapidly.

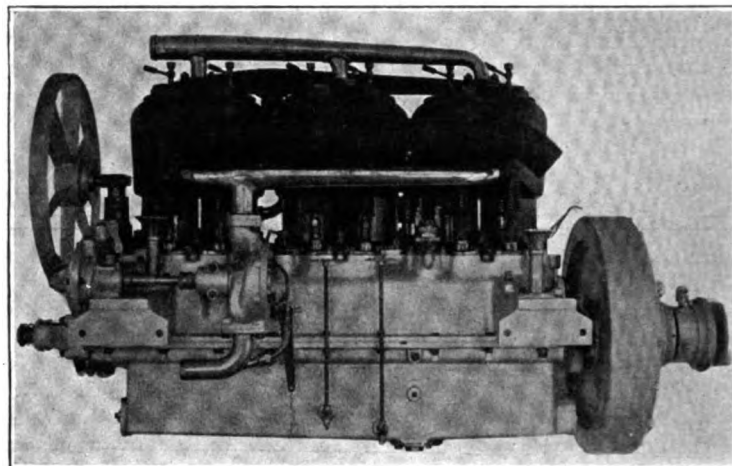
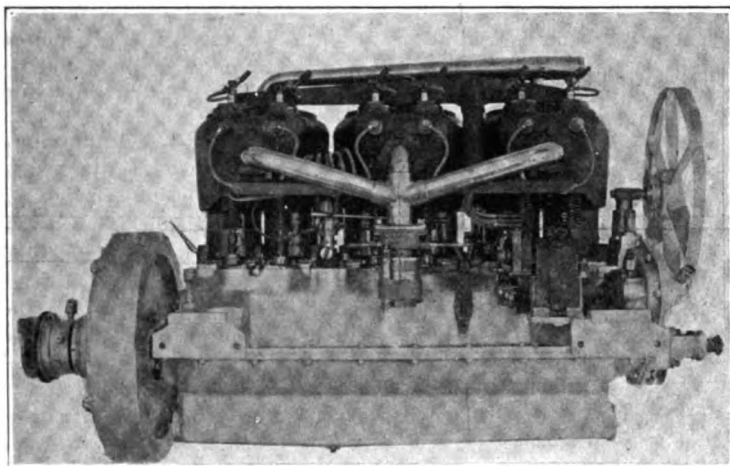
Lawyer Finds Old Law Affecting Accidents

That there exists a law in the State of Illinois called "Deodand," according to which an automobile which has been the cause of death to any person may be confiscated by the State, was the surprising discovery made by a Chicago lawyer last week. J. F. Greeting, who announced his discovery in the course of a lecture before the Chicago-Kent College of Law, declared that if an automobile runs down a man and kills him, that automobile may be taken by the State and sold; and if a wagon drawn by horses kills a man, the wagon and horses may be confiscated, but if the man falls from the wheel of the wagon and is killed only the wheel is confiscated. In the course of his lecture the lawyer explained that all of the old English common law, not expressly repealed here, is a part of the valid statutes of the State of Illinois. There is no record anywhere of the law of "Deodand" being repealed. The word "Deodand," the lawyer explains, means "a gift to God," otherwise the "price of blood, forfeited for the appeasing of God's wrath."

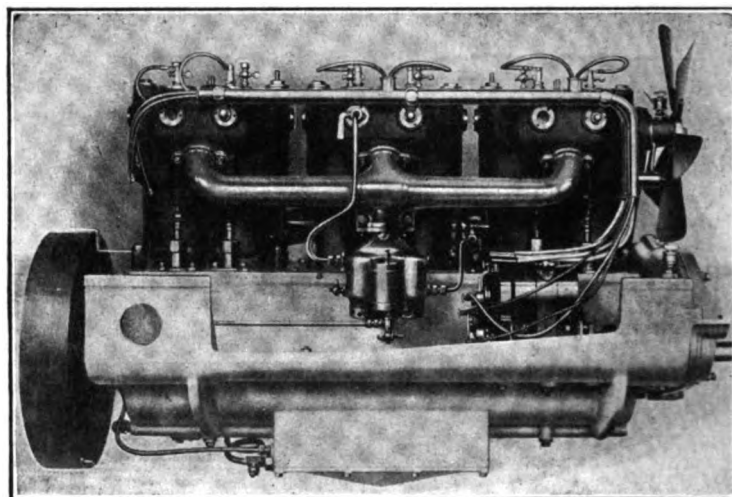
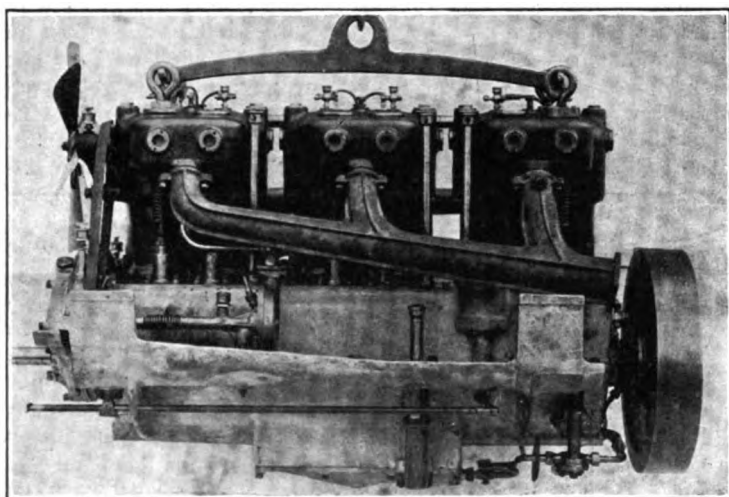
Wedge Automobile Struck by Train.

Railroad crossings have been death traps of many automobiles and their passengers, but it is doubtful if the long chain of accidents attributable to them ever included such a mishap as befell Dr. John A. Quell, a Brooklyn (N. Y.) physician, who got stalled while crossing the Long Island tracks in a forty-horsepower roadster. When he attempted to restart the machine, it skidded sideways and wedged between the rails. A moment later an express train came along and smashed the car to smithereens; its owner, however, got out of the way in time to save himself. The car was only partly covered by insurance.

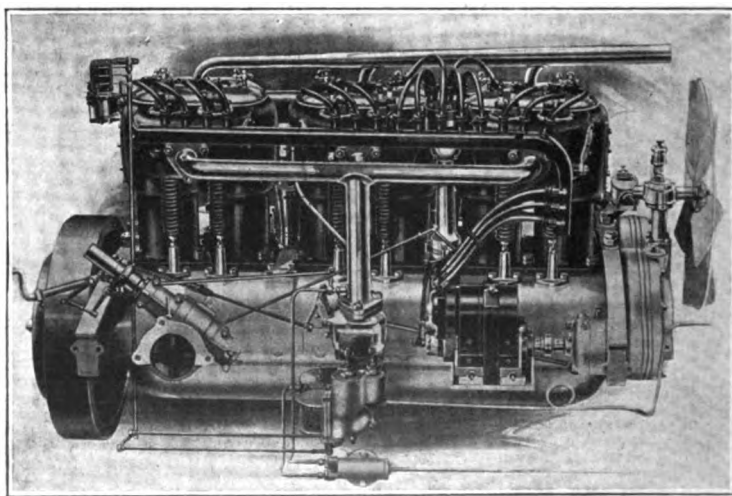
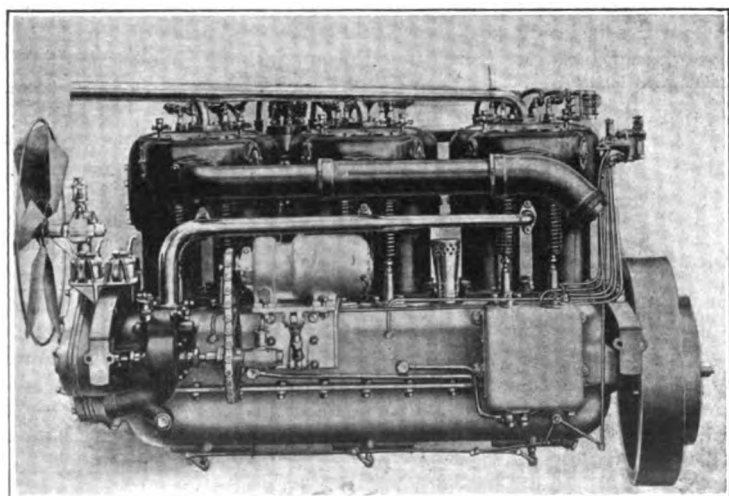
Individuality in Engines of Same Type—"Sixes" Cast in Pairs



INTAKE AND EXHAUST SIDES OF THE THOMAS "SIX" SHOWING LOCATION OF DRAIN COCKS



ALCO DESIGN IN THE DISPOSITION OF INTAKE AND EXHAUST MANIFOLDS AND THE EXTENSION CRANKCASE



WIRING PLAN OF THE PEERLESS AND THE METHOD OF MOUNTING THE GENERATOR AND OILER

Should All Four Wheels Be of Equal Size?

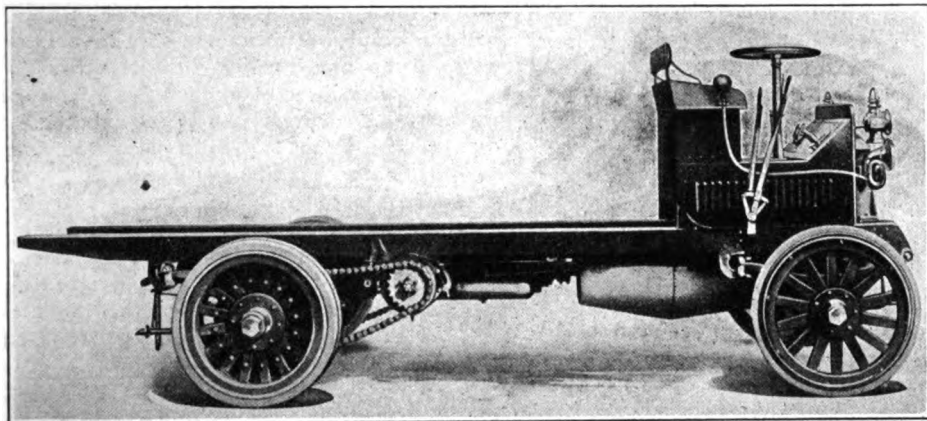
Advantages and Disadvantages of Different-Sized Front and Rear Wheels—Peculiar Difficulties That Confront Designers of Motor Trucks—Demountable Rims an Important Factor in Equalizing Wheel Sizes.

At the beginning of the automobile industry, when no one had had any experience worth mentioning, but every man had his own ideas and pet theories, and was pretty sure they were right, each took a certain pride in being "original" and in en-

fluence on early motor car design, and rear wheels larger than those in front were found on many of the original "horseless carriages," and freight carrying vehicles. As a matter of fact, it usually was easier to build in this way because of the neces-

ed the most attention from engineers; and the difficulties and restrictions encountered are far greater in the "working class" than in the passenger-carrying cars. Probably the last reason is the most important one, for it is notable that the smaller and lighter commercial cars, which have more pleasure car features than their heavier brethren and work under conditions more nearly approaching pleasure car conditions, and therefore are less bound by restrictions, are much nearer to a standard than are the heavy machines, which work under totally different conditions and impose limitations that do not exist in the smaller wagons.

In considering the matter of relative diameters of front and rear wheels for vehicles used solely for commercial purposes, the subject is of course looked at from a commercial viewpoint only. It is evident, from an examination of the specifications of the motor trucks and delivery wagons built in this country that manufacturers have not yet quite agreed as to whether it is best to



HEAVY LOCOMOBILE, FRONT AND REAR WHEELS SAME SIZE

deavoring to prove, by practical application, that his confidence in the children of his brain was well grounded—if he could.

Starting out by devious ways, motor car builders followed their individual notions as to how things should be done with faith and persistence—until they found that other ways were better, and that their theories were untenable. The new ways were not always the right ways, either; but by degrees—sometimes slow and painful—they worked around to the conclusion that there is but one right way of doing a given thing, and that it is far better to do it that way, even though it be commonplace, than to be "original" and a failure. So it has come about that the automobiles of today are very much alike in their essential forms and features, and the differences that still exist are yearly growing less—in other words, makers are finding the best ways of doing things, and the majority of them are doing certain things in practically the same way. What the ultimate result of this process will be cannot be foretold, but it makes interesting matter for thought.

One of the details regarding which there has been a great deal of diversity of opinion, and which makers seem to have agreed upon only within the last few years, is the relative diameters of front and rear wheels, and of their tires. Undoubtedly the influence of the horse-drawn vehicle, passenger and freight, wielded a powerful in-



WALTER TRUCK WITH UNUSUALLY LARGE REAR WHEELS

sity for allowing room for swinging the front wheels in steering; so the path of least resistance helped along the "original" ideas and pet theories quite largely. In this, as in other matters, practice very often seemed to uphold theory.

In the matter of standardization of ratio of wheel sizes, as in standardization of most other features of design, commercial vehicles are behind their predecessors, the pleasure cars. There are several good reasons for this. The pleasure cars were first in the field; they have been built in far greater numbers, and therefore have receiv-

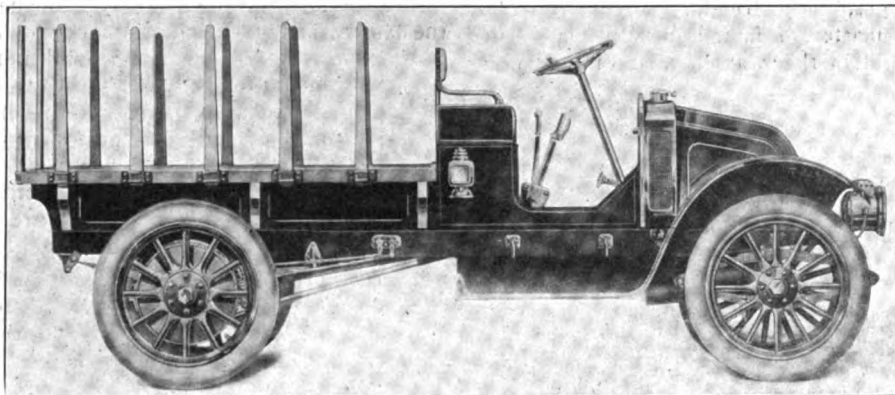
have the front wheels smaller than those in the rear, or to have all of the same diameter. A majority of makers of machines of the lighter types—up to three tons capacity—make their wheels of equal diameter front and rear; and the majority is quite a substantial one, the ratio being about four to one. In the "heavy brigade," however, the tables are turned and rear wheels larger than those in front outnumber the equal size class by something like five to three. Taking the whole range of American commercial cars, the advantage is on the side of the makers who believe in one wheel

diameter on a vehicle, about 60 per cent. of the manufacturers building their cars in this way.

While there is an increasing tendency towards the use of the same diameter for both front and rear wheels, it is most pronounced in the lighter types, which naturally increase in numbers faster than the heavy cars, which seem to favor large rear wheels. In light vehicles the problems to be solved are quite different from those which confront the designers of heavy cars. The ponderous, crushing weights that cause most of the difficulty with the machines of, say, four tons and upward do not have to

great advantage to be able to use that tire on any wheel.

From a manufacturing point of view there is a good deal to be said in favor of using a single size of wheel all round. In the case of a very light car the wheels often can be made all exactly alike, excepting the differences in hub construction due to the application of the driving power. Time, trouble and expense are cut down in no small degree by using but one size of tire. This applies only to such machines as can properly use the same tires front and rear—machines carrying light loads with approximately equal load distribution.



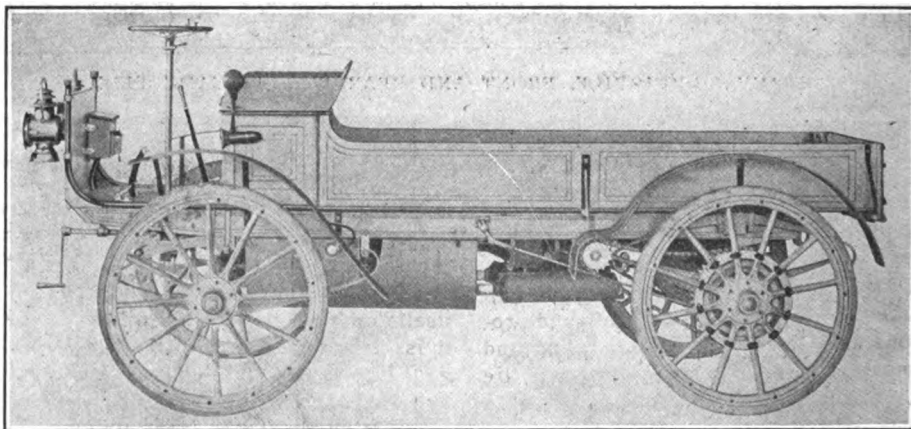
LIPPARD-STEWART LIGHT TRUCK WITH PNEUMATIC TIRES

be considered, and satisfactory tire service resolves itself largely into the mere selection of tires of suitable dimensions and quality. Wheels can be made of large diameter, proportionately, because, though they tend to increase the height of the frame, the loads carried are not so ponderously heavy that they cannot be loaded without particular difficulty. There is much to be said in favor of equal sized wheels, front and rear, for light cars, and practice indicates that there is more to be said for than against them. Large front wheels tend to make a vehicle easier riding because they will roll over road depressions that small wheels would drop into; therefore, large wheels lessen vibration. This result is beneficial to the frame, springs, steering gears, axles—in fact, every mechanical part of the machine—to say nothing of increasing the comfort of the driver and reducing the danger of breakage of fragile goods.

It is of course natural that the tires on a large wheel will give a greater mileage than on a small one, other things being equal, because of the increased wearing surface and the smaller amount of heat generated, while the reduction of vibration and the smoother rolling has some effect on the tires as well as on the rest of the car. In cars fitted with pneumatic tires it is of course a distinct advantage to be able to shift the front tires to the rear wheels, and vice versa, when the rear tires, which naturally wear much faster than the front ones, begin to show signs of weakness; and in case a spare tire is carried, it is a very

to road inequalities, which increase the momentary load many fold, but they must transmit all the driving power—a combination of stresses that calls for the very best in design, material and workmanship.

Usually the front wheels of a heavy truck are made as large as conditions will permit. There are several limiting conditions. The larger the wheel, the more space it must have in which to turn for steering purposes, and while a good deal of room can be made by the very common expedient of narrowing the frame, there is a practical limit beyond which this cannot be carried. Raising the frame means increasing the height of the loading platform—a very undesirable thing, in view of the great weights that are handled and must be raised to the platform level. Again, the axle must not be too high, for there must be clearance for the crankcase of the motor, so that there will be no possibility of its striking the axle, no matter how much the front springs may be depressed. Here another compromise is made by dropping the axle in the center, but this too has its limits which cannot be passed with safety. Placing the axle sufficiently far forward to clear the crankcase will not do, for the simple reason that it will throw too much weight on the rear wheels and unduly lengthen the unsupported section of the framing. It is clear,



LIGHT WAGON WITH EQUAL SIZED WHEELS—THE VEERAC

In the case of the heavy class matters are very different. The problem of making the tires give adequate wear under the tremendous loads imposed upon them is a big one, and a good deal must give way to it. For mechanical reasons an equal distribution of the load is practically impossible, and even if it could be arranged, the weight on the front wheels would make steering an extremely difficult matter. Heavy truck practice therefore varies considerably, some makers placing on the front wheels just as much weight as can be carried and still permit reasonably easy steering, while others go to the opposite extreme and carry their loads almost balanced over the rear wheels. In any case, the rear wheels and tires are severely taxed, for not only must they carry the dead weight of the load, to say nothing of withstanding the shocks due

therefore, that the front wheels are decidedly limited as to diameter, and that any attempt to make them very large must be at the expense of vital features of the vehicle's construction.

The rear wheels, however, are not so closely confined by conditions. There must be room between the axle and the frame for full spring action under all road conditions; the space required for the springs themselves can be cut to a minimum by the common expedient of attaching them to brackets riveted to the outside of the framing instead of placing them directly beneath, or they can, in extreme cases, be of the underslung type—a method which is adopted in the case of some very heavy trucks. Usually there is room enough so that rear wheels can be made of as great diameter as may be desired, so far as the

STARTER FOR ALL-AROUND WORK

Optimistic Inventor Claims It Will Drive a Car and Keep the Tires Pumped Up While Running—How It Works.

Operating on the principle that if air is pumped into a receptacle as fast as it leaks out the air pressure will remain constant, the Knickerbocker self-starting air compressor and tire inflator is in the stages of development at the hands of its inventor, J. Knickerbocker, whose habitat is San Diego, Cal., and soon will be placed on the market. And according to the inventor himself, who holds the roseate views common to all inventors, it is destined to revolutionize the automobile industry, for in addition to operating as a tire inflator and an engine

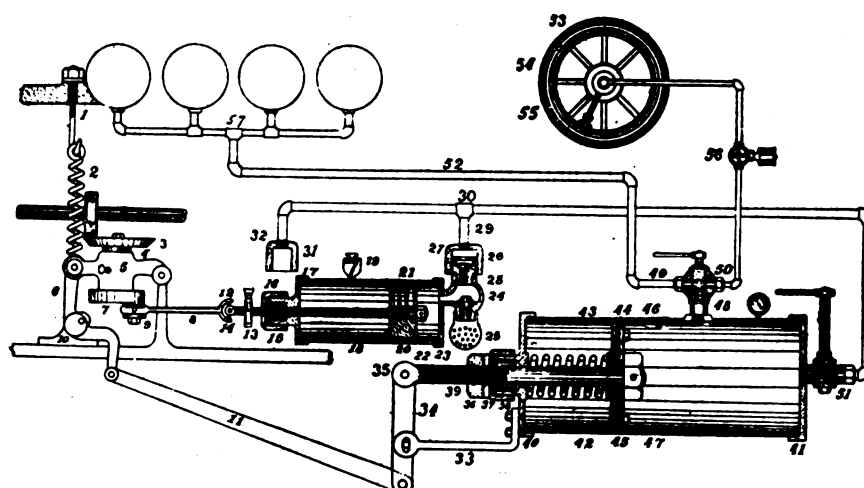
sets merrily to work. When the pressure has reached the proper amount, the spring behind the piston is compressed and through the system of leverage the pump is disconnected; the whole system therefore is entirely automatic.

The most unusual part of the arrangement lies in the method of inflating tires. From the reservoir, a small pipe is led to each wheel hub, through which another pipe is led to the tire. Thus it is not necessary for the driver to move from his seat to inflate a tire, as the series of valves for all four are placed within reach of his hand. Furthermore, tires may be inflated while the car is in motion, regardless of its speed. The most remarkable part of the system, however, is that the air may be turned on and "will keep the tire up to 60 pounds or more, until tires are worn out, no matter if there are 10 nails sticking through the tube." "This is another saving, not only in

frame is concerned. While the body, projecting, as it usually does, over the wheels on each side, in some cases forms a boundary which cannot be passed, there are certain types which can be recessed for the tops of large rear wheels, though this is necessary only in extreme cases.

In the heavier types of trucks dual solid rubber tires are invariably used, for it has been found that single tires of sufficient areas, theoretically, to carry the loads will generate heat rapidly under load and dissipate it slowly, the result being the destruction of the useful qualities of the tires. Increasing the diameter of the wheels increases the working surface and the heat radiating area of the rubber; but in some cases manufacturers prefer to use rear wheels of the same diameter as the front ones, and dual tires make this arrangement possible. A majority of heavy truck builders, however, still take advantage of the increased quantity of rubber available in larger wheels, in addition to using dual tires, the ratio being about five to three.

Pleasure cars are surrounded by conditions that are entirely different from those which obtain with commercial vehicles, and it is natural, therefore, that the results should be somewhat different. Generally speaking, the question of obtaining sufficient tire area to carry pleasure car loads safely and without heating of the rubber is not one that causes any trouble, for it is easy to equip a car with tires that are equal to any demands that may be made upon them. The weights carried are comparatively low and their distribution is not the serious matter that it is in heavy trucks; and the weight placed on the steering wheel is so slight, comparatively speaking, that it does not enter very largely into the question of steering. With so few restrictions, the maker of the pleasure car is free to make use of wheels of such sizes and proportions as will give the easiest riding and the most economical results as to tire wear, and the consequence is that American pleasure cars are practically a unit in having wheels of equal diameter, front and rear, and also in using the same tires all round. There are very few exceptions in either case. This arrangement seems to be best for easy riding, and certainly is an advantage from the point of view of tire economy, for a single spare tire or inner tube will answer for any wheel, and when the rear tires begin to wear owing to their having to carry the greatest weight and at the same time to transmit power, they can be changed to the front wheels and the front tires, which will be in much better condition, put in the rear. There still are a few makers who build cars with front wheels that are the smallest; but whatever arguments they are able to put forward in favor of their arrangement are fully answered by the attitude of the great majority of American manufacturers in agreeing upon the use of a single size of wheel and a single size of tire for all four wheels.



DETAILS OF KNICKERBOCKER'S REMARKABLE DEVICE

starter, it may also be used to run the car itself "on a very level road." "This alone," it is explained, "will result in a saving on gasoline of 20 per cent. and will pay for the Knickerbocker device."

The mechanism thus smacks of the perpetual motion machine but its application is not entirely new. Just how it performs its manifold duties is made plain, with the help of a generous imagination, in the accompanying plan of its intricacies. In the large tank, which, with the rest of the apparatus is carried below the chassis, air is stored under 90 pounds pressure, the method of obtaining the pressure being as follows: When there is no air in the tank, a movable piston is forced away from one end by means of a spring. Connected to the piston by means of a number of fearfully and wonderfully shaped rods and levers is the friction pulley by means of which the pump is driven from the flywheel of the engine. Therefore when the air pressure in the tank drops below a certain predetermined figure, regulated by a safety valve, the piston moves toward one end of the tank, the friction disk is brought into contact with the flywheel and the pump

changing tubes," it is stated by the versatile inventor, "but time, providing the outer casing will hold out this can be run 1,200 miles with all the nails and tacks the tires can pick up, as there is 90 pounds being pushed into the tire as fast as the motor can put it there, and at on time can the tube get more than 60 pounds unless more pressure is wished for."

As an engine starter, the air is used in much the same manner as in other starters of the air and compressed gas type. Which is to say the compressed air is admitted to the cylinders in their working order by means of a distributing valve. As the reservoir continually is being charged to 90 pounds, it is stated that this "allows you to use air after making a hard pull up a steep hill, cutting out the gasoline and allowing cool air pressure to work through the cylinders." As has been mentioned, it is further stated that "the air will hold on a very level road."

Knickerbocker is at present engaged in building an automobile with which it is his intention to tour the length and breadth of the land demonstrating the merits of his invention.

INCREASING MAGNETO EFFICIENCY

Remy Engineer Urges Improvements in Mounting and Other Respects—Points Out How to Effect Them.

That there is considerable room for improvement in the motor designs of not a few manufacturers is the opinion of F. E. Moskovics of the Remy Electric Co. The improvement, he pointed out, in a paper read before the annual meeting of the Society of Automobile Engineers, concerns the location of the magneto and in further substantiation of the statement he asserted not only its position, but even the material of the bracket on which it is mounted has a greater effect on the ultimate efficiency of the instrument than generally is supposed.

"Experiments have shown," he said, "that with certain magnetos the use of a magnetic metal in the engine base has caused a loss of as much as seven per cent. in the magnetic flux, which in turn effects the total efficiency of the magneto, particularly in slow speed work." For which reason he urged manufacturers who employ cast iron crankcases to make the magneto case up separately from the engine base, and to use a non-magnetic material in its construction.

"The magneto manufacturer has had considerable annoyance to combat in the past, due to the fact that many engineers have not given sufficient thought to the correct disposition of the magnetos in their original designs," Moskovics stated. "Some of this is adjusting itself automatically with the advent of the long-stroke motor, due to the fact that inlet and exhaust manifolds are considerably higher than previously. But there still remains considerable room for work in this direction.

"In considering the magneto in its relation to engine design, it might be well to make five classifications, as follows:

"First: There is the consideration of the proper location of the magneto, so that it will be free from excessive dirt, grit, water, oil, heat and other engine discharges.

"Second: To so locate that the main parts of the magneto are accessible and visible; also not to obstruct or interfere with the accessibility of adjacent engine parts.

"Third: Accurate means of alignment with the driving mechanism—to eliminate undue wear on the universal joints, which in turn results in other disastrous strains, such as endthrust in the armature shaft, etc.

"Fourth: To so locate spark advance levers that they will operate freely and smoothly, giving full advance and retard without undue strains being set up.

"Fifth: Proper wiring of both primary and secondary, and location of coils.

"Under the first head precaution should be taken that the magneto be so located that water or oil connections that might in time become leaky should not be close enough to cause trouble. Protection from the usual oil discharges from valve tappets and gear drive should be given. The enclosing of valve mechanism is curing much of this evil.

"Care should be taken that the exhaust manifold is sufficiently clear of the distributor parts to absolutely insure their not being affected by that heat. Some magneto manufacturers are using a form of fire-proof distributor for that very reason, such as Bakelite.

"In motor layouts where the carburetter is on the same side as the magneto it is often situated dangerously near the magneto circuit-breaker and the distributor. This practice is to be deplored for many reasons. The carburetter flooding directly on the magneto or allowing waste gasoline to collect near the sparking apparatus is frequently the cause of dangerous fires. This is especially the case with web-supported crankcase arms. It must always be borne in mind that most magnetos are supplied with an exposed safety gap which is surrounded by a combustible mixture will immediately cause fire.

"Under the second head the writer would strongly urge that great care be taken by the engineer that the parts necessary to properly time the motor be easily accessible without the necessity of any unusual acrobatics on the part of the operator. This refers especially to the universal joint and the breaker box. Forms of joints which allow variable and positive means of setting are strongly recommended, and if accompanied with explicit instructions for timing will avoid the usual demounting of the gear covers to shift those usually inaccessible parts. It is also urged that in those motors where the magneto and carburetter are on the same side, sufficient room be allowed to make easy the examination of the platinum points in the breaker box without the use of mirrors and other make-shift methods. On many cars the magnetos are placed so low that it is impossible to get at these essential parts without the removal of the sodpan.

"Under the third head we come to probably one of the most prolific sources of trouble; due to either improperly designed joints or improper machining of the magneto gears, also the eventual breaking down of the bearings supporting the armature shaft, especially in ball-bearing magnetos. The ordinary type of Oldham coupling in which the female member has become worn tends to create endthrust in the magneto bearings which they were never designed to absorb. So great care should be taken in machining the magneto base-plate to the exact height and then furnishing rigid means of securing the magneto and seeing that the joint used is one that under a little wear will not tend to

create undue endthrust. The writer would strongly urge that all universal joint parts be carefully hardened and that the material used be one which will take a good coat of case-hardening.

"The fourth consideration is purely a case of mechanics. Many designers leave this matter in the hands of inexperienced men, with the result that the breaker box is often subjected to strains it was not intended for. Levers are often inadequate for the work in hand; proper regard is not paid to the levers, and often only a small part of the quadrant is used, and owing to an entire disregard of the law of the lever it is a matter of some inconvenience to advance and retard the breaker box.

"Particular attention should be paid to the method of rotating the cam house, for if the force is not applied in approximately the same plane as the cam house bearings, there is a decided tendency toward undue sticking and consequent wear. In order to avoid cramping and stiff working of the control mechanism properly designed cranks and clevises and ball knuckle joints are advised. If possible the control mechanism should be so arranged as to be easily taken down. Split pins are very easy to put in but often are exceedingly difficult to get out.

"Too little attention has been paid to the extremely important matter of wiring. On the modern cars the high tension circuits are usually well placed, due to the fact that trouble in them is so self-evident and develops so early. The art has progressed to such a point that probably any suggestions on the disposition of the secondary wiring would be superfluous. But it is to be urged that it is equally important to carefully segregate and insulate the primary wiring if for no other reason than the fact that it takes a long time for them to give trouble, but when they do it is one of the most annoying things to locate in the motor car. They should be located in such a position that they will be free from oil and gasoline drippings and the heat of the exhaust manifold and that vibrations of different parts will not tend to chafe or wear them. It is also suggested that where the primary wires leave a rigid part, such as the dash, a sufficient length should be left slightly coiled to fully compensate for any motion between these parts. With the advent of the acetylene and other starting devices of the internal combustion type the matter of the location of the secondary coil again becomes a subject of some import. Practically all ignition manufacturers supply weatherproof coils, but all are not heat-proof or oil-proof. Therefore it is suggested that it would be good practice to so locate the coil that the heat of the motor will not affect it any more than is absolutely necessary and also that it be free from the oils, water, gasoline and other engine discharges. This will add considerably to the useful life of the ignition system.

Solid Tires and Some of the Problems Entailed

Whole Range of Subject Instructively Discussed by a Qualified Expert—How the Several Forms of Tires Are Made—Large Wheels, Ample Tires, Standardization and "Demountables" the Factors That Make for Real Economy.

Not often, certainly not in such concise form, has the construction of solid rubber tires been more clearly outlined than in the paper read by Charles B. Whittelsey, of the Hartford Rubber Works Co., at the annual meeting of the Society of Automobile Engineers last week. The "Mechanical Points in Connection with the Construction of Solid Motor Tires," he entitled the subject and almost with his first words Whittelsey proceeded to deplore the unfortunate lack of knowledge of construction and fundamentals which is displayed by the average owner or driver, which, he said, is directly traceable to the manufacturer.

"Solid motor tires can wear away and suffer as much from misuse as the pneumatic tires," he said, "and it has been said that lack of knowledge of it lies largely with the manufacturers by their never, to any extent, educating the users of their product to an appreciation of the tremendous difficulties that have been surmounted in arriving at the present state of efficiency—or of the endless amount of experimental work they have done, and the discouraging setbacks that they have had in their efforts to place at the disposal of the public the solid motor tire of to-day."

"It is uncertain when or where solid tires first were used for wheels on vehicles," he continued, prefacing an illuminating story on the present day methods of construction. "However, the use of such tires was not common until after the year 1881, when the Carmont tire first was used on hansom cabs on the streets of London. The tire adopted in 1883 was Carmont's patent of 1881—A rubber tire held in rolled steel channels in a state of compression between converging flanges."

"The Carmont tire was the first solid tire introduced in America, by the late Channing M. Britton, of the important New York carriage firm, Brewster & Company, for which Mr. Britton obtained the American right under the Carmont patent. Several tire manufacturers made quantities of tires for them."

"The next practical advancement in the development of the solid tire made in America was under the patent granted to A. W. Grant in 1896, later known as the Kelly-Springfield tire. This tire being seated in a rim channel with diverging sides there was no loss of resilience from the compression of any part of the rubber. The channels were not as deep as in the Carmont type, and a larger percentage of rubber was

available for wear. The rubber body was held into place by means of circumferential wires running through the rubber and forming circles of smaller circumference than the rim flanges. Since the introduction of the Grant patent the use of solid tires has increased steadily.

"The next patented tire which was developed to any great extent was the side wire tire—a tire held into position by two endless circumferential wires sprung over the edges of the channel which engaged the ends of embedded cross bars, thus holding the tire securely in the channel."

"These and many other solid vehicle tires were made and used on cabs, carriages, etc., until the vehicles became motor driven. The weight and speed of the motor vehicles increased as well as their carrying capacity, which made this style of tire altogether too light to perform the work required of it. This condition brought about the invention of the solid motor tire—a tire vulcanized in circular endless form to fit the dimensions of a wheel. This type of tire has been brought out in different designs and types, such as flanges, internal wire, side wire, hard rubber and metal base types; also the demountable."

"The construction of the solid motor tires that have been put on the market up to the present time is very similar in a general way. The rubber is forced through a die of a tubing machine, or built up from thin sheets of calendered stock in endless form to fit the exact dimensions of a wheel, on a particular style of base or retaining body of the tire, as designed by the different rubber manufacturers, according to their various ideas of efficiency, which have taken various forms, such as circumferential and side retaining wires which are engaged over embedded cross wires, base of hard rubber in various forms, also of semi-hard rubber which can be molded into the tire, and more recently, the plain metal base types which are most successful."

"The rubber portion of a solid motor tire is usually about two and three-quarter inches high, and varies in width according to its design. The tire is built so that when it is applied over the steel band of the felloe of the wheel it fits so snugly that it has to be forced on with a press specially designed for this purpose. This is done so that the tire will not creep circumferentially or laterally. When the tire is in position on the wheel, it is further secured by steel flanges bolted on each side of the wheel, also to

prevent its creeping or working off the wheel."

"The side wire motor tire is built in similar shape, but cross wires are inserted throughout the base of the tire at stated intervals. It is placed in a channel made for this purpose and side endless circumferential wires are applied on each side of the tire over the ends of the cross wires in the base of the tire, which holds it in position in the channel. The tire in the channel is applied to the wheel over a wood or steel band on the wheel."

"Metal base tires are built up of compounded rubber in graduated consistencies from the hard base which forms their inside circumference next to the steel base to which it is vulcanized, to the resilient rubber that forms the wearing part of the tire. This rubber tire is vulcanized to a steel tire band which is applied by pressure to the wheel over the steel felloe band with either a hydraulic or specially built press. It requires from 60 to 90 tons pressure to apply these tires to a wheel and it has often been found necessary to use more than 90 tons to remove tires so applied. This frictional contact makes it unnecessary to use any side flanges or other fastening."

"The size, shape and dimensions of these types of tires are varied according to the designs of the manufacturers—no two being the same in any of these particulars. The service obtained from a given diameter and cross-section of these varied types of tires is as varied as the different types. The reasons for this can be attributed to the variation in the cubical contents of the cross-section of the tire, some designs having a much greater amount of rubber than others, and, therefore, the distribution of pressure over the different sizes of tires caused by the intensity of pressure per square inch brings a greater or lesser area of the tire in contact with the road, and as it is only that part of the solid rubber tire which is in contact with the road that is carrying the load, the tire with the greater area at this point performs in the most satisfactory manner and will be the longest lived."

"The height of the rubber from the tire seat governs largely its elasticity and cushioning effect. A tire too high and narrow cannot stand up under a heavy load. It will weave from side to side. A tire worn down to a short distance from its non-extensible base loses its cushioning effect, and instead of the uneven conditions of the road

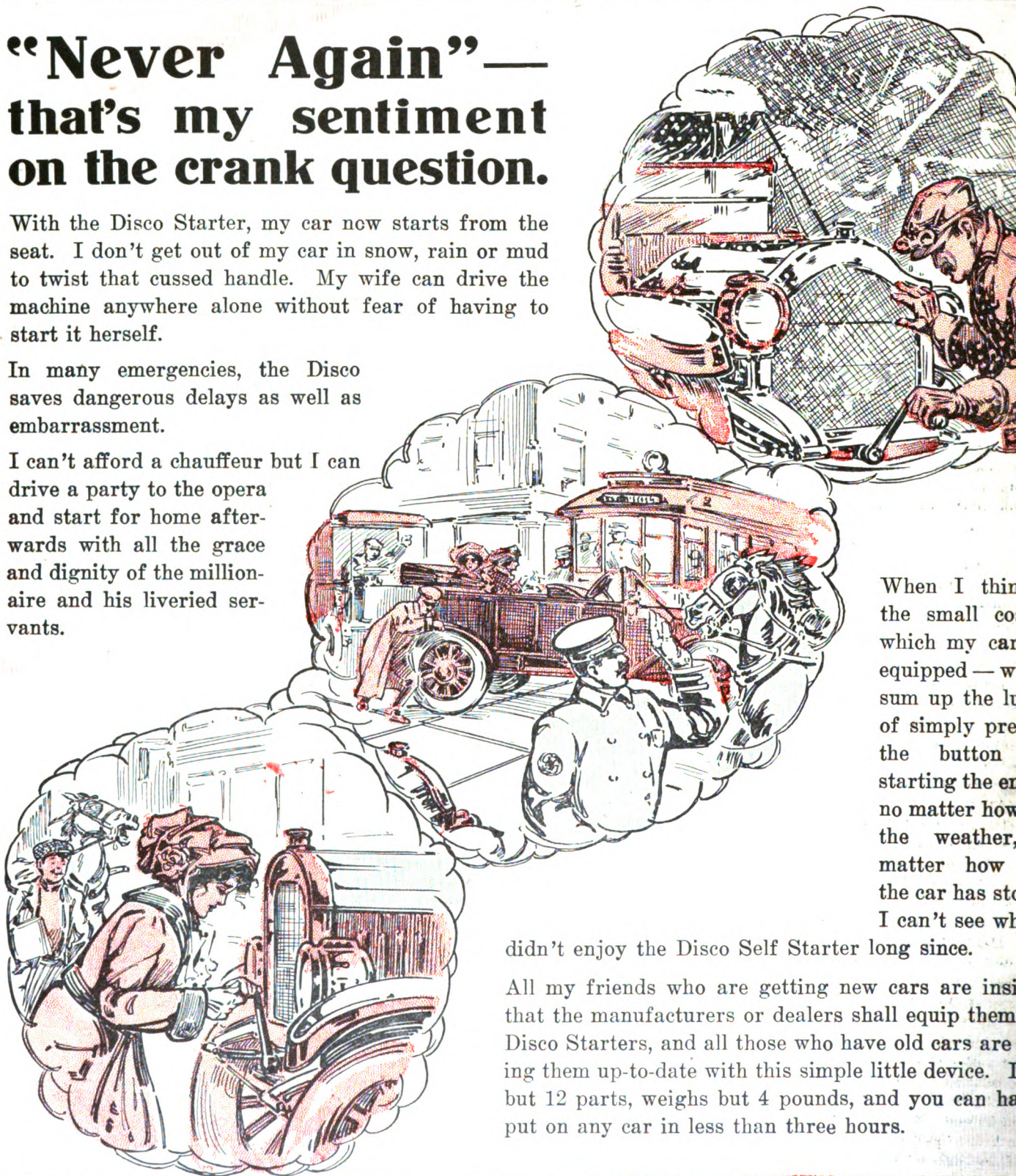
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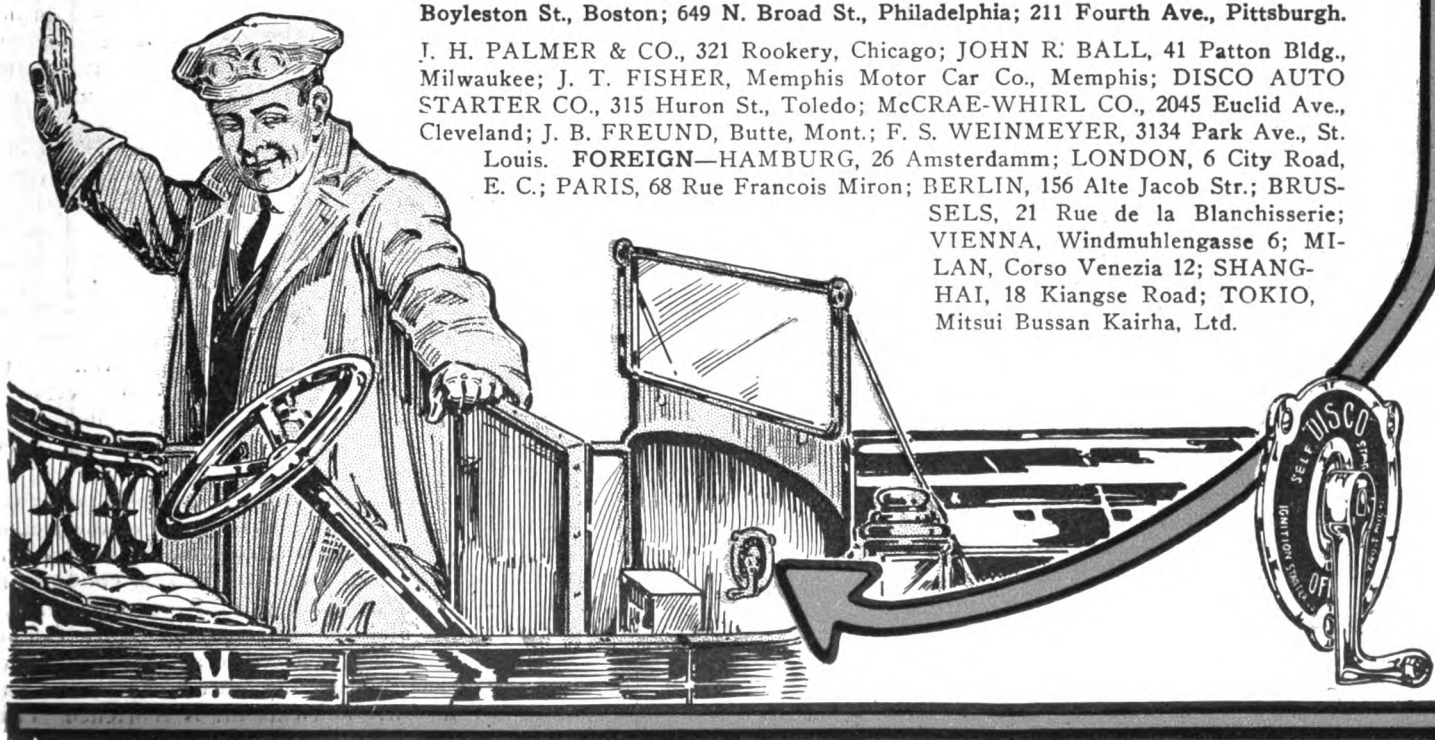
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being absorbed by the rubber, the tire is hard and transmits the shocks of pumping over it to the truck, and soon racks the truck and its motor, so that repairs become necessary.

"The life, strength and durability of the tire lie primarily within the compounded rubber of which it is made, and also its construction. Other conditions being equal, the tire made of the highest grade of rubber has the longest life and is the most resilient. Certain minerals are added to give it strength and durability, the quantities being varied according to the best judgment of the tire manufacturer. The proper size tires, which are dependent on the speed of the vehicle, applied on an electric truck driven at eight or ten miles per hour, will give greater mileage and much longer life than the same size tires on a gasoline truck driven from 12 to 15 miles per hour. The carrying of a ton at a speed of ten miles per hour is a very different proposition to a tire than carrying the same amount of load at 15 miles per hour. Greater mileage can be obtained from tires run in a city devoid of very steep grades.

"Heat is the result of motion, and as the tire when in motion is continually being pounded between the road and the steel band of the wheel, it develops a great amount of heat within itself, which is transmitted throughout the tire, and has a tendency to shorten the life of the compounded rubber. The heat developed in solid tires is much less in the fall and winter and spring of the year owing to the cold roads, water, snow and ice. The number of months' service, as well as the mileage, a solid tire may give is influenced by the load a truck has to carry, the speed at which it is driven, and the nature of the country where it is used.

"Tires on wheels of greater diameter give longer and better service, because of the greater area of rubber in contact with the road, as well as the fact that they do not have to travel so fast, and, therefore, do not generate as much heat, or deteriorate so rapidly. Neither do they travel so far and wear down as rapidly as the tires of smaller diameter. Actual experience has demonstrated that big wheels and tires are better on heavy grades in particular.

"A solid motor tire for an electric truck must be made from a compounded rubber stock which is soft and most resilient. It must absorb the unevenness of the road, and resume its normal shape instantly, so as to lessen the traction of the vehicle. By the absorption of the shocks the consumption of electric current necessary to drive the truck is reduced to a minimum. This is largely dependent upon the resiliency of the compound, as well as the shape and size of the tire.

"Many shapes have been tried out for use on electric trucks—the standard oval shape prevailing. The corrugated or grooved treads present less road contact and assist in preventing skidding. Tires

molded with these grooved treads and under-cut webbed sides afford an additional cushioning effect and are very successful on electric vehicles. The styles of tires used on electric vehicles are the same as those offered for other classes of vehicles. The size of the cross-section also affects the cushioning qualities of the solid motor tire on electric trucks, one of which is approximately eight square inches in area for four-inch section, and the other ten square inches; for the one with the greater area will cushion and carry a greater load, absorb the shocks better, give longer life, and better service.

"The life of the tire on electric vehicles is much longer than on gasoline machines—due partially to the low speed of the vehicle. From this class of vehicle being run at lower speed, it is handled with much more care than a high-speed truck; therefore, unknowingly, the tires receive more consideration.

"Dual or twin tires are applied on the rear wheels of trucks built to carry heavy loads, and subjected to the most severe strains, as it is known that when these dual tires are of the proper size they have greater sustaining power from the distribution of the load over the two tires on a single wheel. However, it is frequently demonstrated that one of the twin tires gives out before the other—due to the fact that they have been driven over uneven roads where one of the tires on the wheel has had to carry the entire weight of its wheel a greater portion of the time and has given out from being overloaded.

"Block tires are sections of solid tires vulcanized to steel plates or held in position by steel sectional frames fitting over the blocks of rubber with a wider base, or protruding wires in the base. This style of tire is used principally in duals on the rear wheels of the larger motor trucks subjected to most severe work. When driven rapidly, there is but little unevenness of motion felt from the tire being so constructed. The tire does not generate heat within itself as rapidly as a solid tire, owing to the fact that there is a space of an inch or more between the blocks which enables the rubber to yield more as it rolls up ahead under the traveling load. There being no communicating rubber between the blocks, the heat is confined in each block, which can be removed or replaced when it is injured or worn.

"Block tires afford a very good non-skidding quality, and are excellent on soft roads as there is but little slipping in wet, slippery places. In winter the spaces between the blocks pack with snow and ice, and the tire then loses its non-skidding and gripping effect. In all seasons the block tire picks up stones between the serrations, and these small stones embed themselves in the rubber, and should be taken out with a strong screwdriver or any other similar tool before they have time to cut and work into the blocks of rubber.

"The demountable solid motor tire has

been too long delayed. The cost to the tire manufacturer, truck manufacturer, and the truck owner, of the delay of laying up the truck while the wheel is taken off and sent by express to the nearest branch or factory of the tire manufacturer and the old tire taken off and the new one applied is entirely too great. This expenditure of time and money will be avoided when the tires are all demountable and interchangeable like pneumatics that are used for the pleasure car.

"The greatest of solid motor tire troubles is the separation of the tread from the base of the tire before the tire has given satisfactory mileage. While some of the troubles have been due to the construction of the tires, the principal causes of trouble have been overload and overspeed. The truck manufacturers have not equipped their trucks with tires sufficient in size to do work demanded of them. The tendency is to under-rate the overload that is going to be put on the truck soon after it is turned into service, just as in the case of pleasure cars until recently. Sufficient allowance has not been made for the portion of the load that is carried on the rear wheels, and trucks are daily equipped with under-size tires that will go to pieces within two or three thousand miles instead of lasting six or seven thousand miles. Truck manufacturers will some day learn that the reputation of their trucks for "eating up tires" costs them more than the difference in cost between undersized and proper size tires—a great many times over.

"This point leads us to the standardization of the tire and wheel dimensions and fastenings, which was accomplished by the Society of Automobile Engineers on July 15, 1911. What does this mean to the tire manufacturer? The expenditure of thousands of dollars to make an entirely new equipment in which to make his solid tires to conform with the new dimensions that the S. A. E. standardized. What does this mean to the wheel and truck manufacturers? A saving of thousands of dollars. Instead of having to carry as many wheels in stock as there are varieties of tires to fill an order for any given size, the S. A. E. standardization has reduced this to one wheel for any make of tire for any given size.

"The time will come when the cubical contents of the tire will be standardized, also the demountable fastening, so that the difference in service of any given size tire will be measured by the difference in the quality of the compounded rubber that it is made of by the different tire manufacturers.

"The pneumatic and the solid motor tires have made the development of the pleasure car and motor truck possible, and yet they have been given less serious consideration than any other part of the equipment. A given amount of rubber and fabric can perform only a measured amount of work, the same as steel and other products, and when it is overtaxed its life is shortened exactly in proportion to its abuse."

American Wheel Makers on the Wire Wheel

Two of Them Investigate the Causes of Its Popularity Abroad and Find Scarcity of Proper Wood a Contributing Factor—They Deal at Length with Foreign Tests Which Appear to Indicate Superiority.

Controversies anent the relative merits of wood artillery wheels and wire wheels have not been scarce, and it is therefore natural that during the recent European trip of the members of the Society of Automobile Engineers, considerable attention should be given the subject. Some of the results of the investigations which were made with a view to ascertaining the reason for the popularity of the wire wheel in England were disclosed at the annual meeting of the Society of Automobile Engineers in New York during the three days commencing Thursday, 18th inst., and ending Saturday, 20th inst. The disclosures are interesting inasmuch as they tend to prove that the extensive use of wire wheels abroad is largely of necessity bred of the impossibility of producing satisfactory wood wheels. At least, that is Bert Morley's opinion, expressed in a paper read during the S. A. E. session, and because of Morley's long experience and association with the Kelsey Wheel Co., there are few who are more competent to judge or whose opinions carry more weight.

"Although admitting that the wire wheel possesses certain merits when used under certain conditions," he said, "I am not prepared to say that our wood wheel is likely to be supplanted by the wire wheel, at least for many years to come. In England, wood stock suitable for automobile wheels is not commercially available and in the preparation of their wood they rely entirely on natural drying. Apparently no concern prepares its woods by the scientific kiln-drying process uniformly employed in our wood wheel factories. For the benefit of our party of engineers several tests were made showing comparative strength of the English wood wheel and wire wheels. Although in this test the English wood wheel was shown to be much weaker than the wire wheel, I feel safe in saying that those of our party who saw these tests will readily agree that the inferior quality of the wood stock is responsible for the relative superior showing of the wire wheel, and that had these tests been made with wood wheels of American stock and manufacture, the American wood wheels would not have suffered in comparison.

"French cypress is a better wheel wood than the English stock because it has a tendency to splinter when broken rather than fracture cleanly. But cypress is objectionable in that it is comparatively soft wood. All the European companies are

much interested in American hickory, as they realize its superior tensile strength and other desirable qualities when compared to their woods.

"As England is the only country that has really adopted the wire wheel, the Englishman's views on the subject are worthy of first consideration; and no one should be better qualified to speak with authority than the pioneers in wire-wheel construction, i. e., the Rudge-Whitworth Company, of Coventry, England, the leading manufacturers at the present time. This firm makes use of the views of Sir Hiram Maxim on the subject of wood as a constructional material by saying: (He having shown that many kinds of wood have a greater tensile strength—weight for weight—than most kinds of steel.)

"It is probable that no engineer could, out of steel or any other material, design and construct anything equal to a living tree; but wood is a dead material, and nature has no further use for it but to decay it."

"This argument hardly covers wheel stock in this country, as no one ever found properly dried wood to deteriorate in structure during the life of the wheel in service because of being dead stock. Properly drying wood stock has the same effect as heat treating steel.

"However, aside from the durability of the material the Rudge-Whitworth company points out that the real superiority of the wire wheel lies in the fact that it is a 'suspension wheel.' Its advantages it presents as follows:

"1. The large number of spokes (72 in our case) insures complete circularity. The twelve spokes of a wooden wheel tend to make the wheel into a twelve-sided figure.

"2. The load in the suspension wheel is carried by a great number of the spokes, while in the wood wheel practically only one spoke at a time takes the load.

"3. By manipulating the design it is possible to give the strength in exactly the direction required. With a wood wheel this is impossible without increasing the width of the spokes and thereby the air resistance.

"4. The suspension wheel being entirely made of steel is affected equally by changes of temperature. The wood wheel with its steel rim is affected unequally and is liable to damage; this is quite distinct from the shrinkage and contraction of wood with different degrees of humidity, which, of

course, have no effect whatever on a wire wheel.

"5. The wire wheel by employing thin material of high heat conductivity plays an important part in keeping the tires cool. This contributes largely to the increased tire economy of the Rudge-Whitworth detachable wire wheel, as borne out by the tests conducted by the Daimler company, which show a reduction in the tire bill of about 40 per cent."

"In considering paragraphs 1, 2 and 3 the fact should not be overlooked that the foreign wheelwright has neither the wood nor the methods to form felloe stock, that we Americans fortunately possess; nor the methods of making wheels. The foreign wood wheel felloe is cut out of small pieces; and although these are carefully matched together, they manifestly present a structural weakness from which the wheels made in this country from whole stock and under hydraulic pressure, are free. Thus the American wood wheel furnishes the 'suspension' principle, which the foreign manufacturer can obtain only through the medium of the wire wheel. Paragraph 4 would seem to apply only to equable climates such as England enjoys. Several of our engineers expressed the belief that extremes of climate such as we have would tend to expand and contract the steel spokes to the breaking point. Paragraph 5 is most interesting. In connection therewith the following from reports on the subject from the English Daimler Co., and Rudge-Whitworth Co., also are presented as worthy of consideration:

"The Daimler company says:

"While it has been quickly realized by the observant motor car owner that wire wheels make for greater strength and safety, and at the same time secure a considerable reduction of dead weight, their beneficial effect upon the life of tires is not so generally known, and we therefore trespass upon your space to record the results of certain experiments which have been carried out by our hire department in London. There careful data have been kept of all tire replacements and repairs, and the following figures show the mileage obtained on heavy covered cars from 100 non-skid 935 by 135 mm. covers, half of which were fitted to wire and half to wooden wheels: Total mileage obtained from fifty non-skid 935 by 135 mm. covers taken from wire wheels, 172,731 miles; average, 3,454.

Total mileage obtained from fifty non-skid 935 by 135 mm. covers taken from wood wheels, 102,524 miles, average, 2,050. Average miles per cover, 3,454 on wire wheels. Average miles per cover, 2,050 on artillery wheels. As the cars employed were practically identical and were run under exactly similar conditions, the results are very instructive.

"To which the Rudge-Whitworth Co. adds:

"The data furnished by the Daimler company on 50 tires on cars with wood wheels and 50 on cars with wire wheels (the cars being otherwise identical) show that wire wheels reduce the tire bill by over 40 per cent. or, put another way, wire wheels saved 4½ cents a mile with the size of car and tire used. The net cost of fitting an artillery wheeled car with Rudge-Whitworth detachable wheels varies from \$150 to \$200, so that the total cost of the change would be saved in under 4,500 miles except in the case of very light cars, where it would probably take just over 6,000 miles to save the first cost. The reduction in tire bill would of course continue after the saving had been affected. It is hardly necessary to add that these wheels can be fitted to any make of car."

"In considering these tests attention is invited to the peculiar conditions of London driving. Road regulations are to drive as fast as you can. The streets are very congested and the idea seemed to be 'Hurry because there are a dozen wanting your space.' This necessitates extensive and frequent usage of the brakes. Under sudden braking strains wire wheels have a radial action or 'give' that wood wheels do not afford. This 'give' is perceptible to the riders when the brakes are applied and also when speedily rounding corners.

"The following are Rudge-Whitworth reports of comparative tests of wheels, which were similar to those conducted at the time we were guests at their plant; and I might say, are more favorable to wire wheels than those we saw:

"1. The static test, which we carry out on a Dennison tensile machine, consists of applying a pull at the rim parallel to the axis of the wheel. This corresponds to the ordinary strain that a wheel gets when rounding a curve. A little reflection will show that it is always the outer wheel which gets the greatest strain, and consequently we have deliberately built our wheels to be far stronger from the outside than from the inside.

"2. The dynamic pendulum method corresponds to the violent termination of a side-slip against a curb. Dynamic pendulum tests are not only quicker to carry out and probably more accurately determine the virtue of a wheel for the purpose it has to serve, but the wreck produced is far more dramatic and attractive than the result of a static test. Most of our tests have been done primarily to inform ourselves and not in any way for publicity, but an

interesting series of dynamic pendulum tests were made in the presence of a representative of the Autocar, from whose report the following summary is condensed:—"One front wood wheel, 870 by 90, and one back wheel (wood) 880 by 120, were tested complete with tires inflated to eighty (80) pounds per square inch, against the same sizes of Rudge-Whitworth detachable wire wheels, and under the same conditions. These latter were so built as to weigh 149.7 pounds, as against wood wheels, 179.84 pounds, both including inners. The weight of the pendulum bob was 450 pounds, arranged to strike the rim itself and not the tire only. The pendulum bob was pulled back by rope tackle and released from different distances up to about six feet.

"The energy is calculated by the formula

$$\frac{W}{2R} E - L (L - 2d) \\ 880 \times 120 \text{ Wheel.}$$

Energy of each blow in foot pounds.	Permanent Deflection.	
	Wood.	Wire.
480	.36 inches	.23 inches
590	.63 inches	.52 inches
700	1.09 inches	1.12 inches
820	7.29 inches	2.37 inches

"The above tests were made in 1908. We give below the figures of a more recent test, from which it will be observed that with a series of five blows terminating in one of no less than 1,040 pounds, the total deflection of the Rudge-Whitworth detachable wire wheel of the triple-spoked type, 880 by 120, was actually less than 1¾ inches. It will be conceded that no similar development has taken place in the wood wheel in the interval."

Shell Type 8 (L. 7,482).
Rim 880 x 120.

Blow.	Energy at Moment of Impact.	Permanent Deflection.
1	546 ft. lbs.	.29 inches
2	655 ft. lbs.	.55 inches
3	777 ft. lbs.	.89 inches
4	907 ft. lbs.	1.19 inches
5	1,042 ft. lbs.	1.57 inches

"Your attention again is called to the fracture shown in the wood wheel. It is safe to say that American hickory tested under these conditions would prove as favorable as the wire wheel.

"An interesting feature of both the wire and wood wheels abroad, is the quick-acting removing hub, making it possible to detach the wheel from the hub and replace with another. This to the English wheel is the equivalent of the demountable rim of the American car. In England the detachable wheel meets the situation, as the majority of cars are driven by chauffeurs, upon whom falls the labor of making the change. In this country the majority of owners drive their own cars and demand a tire and rim that is light, easily removed

and replaced. The detachable wire wheel, although undoubtedly well suited to foreign needs, would not prove satisfactory here, where the demountable rim and quick detachable tire are better suited to the American requirements.

"From the foregoing it is evident that the popularity of the wire wheel in England is more than a mere 'English fad.' The fact is that the wire wheel is there born of necessity rather than choice. That it will continue in favor cannot be doubted, and very properly so, when European road and driving conditions, tire economies, and lack of suitable material and facilities for producing satisfactory wood wheels, are considered.

"The wire wheel has been criticized by some as being unsightly. Any radical departure from conventional lines of design is apt to be opposed from the standpoint of appearance, but as we become accustomed to the change the original offence to the eye is forgotten, particularly if the modification results in added utility. Consequently, although at first the wire wheel looked odd to us, the impression was short-lived; before our departure we were admiring the beauties of some of the wheels produced by the Rudge-Whitworth company and the Riley Cycle Company, for splendid cars used by the English nobility. Although the wire wheel can very properly be relieved of the charge of being unsightly, when clean and well polished, it is open to criticism on account of the difficulty of keeping it in that condition without undue labor. The construction of the wire wheel is such that it is a dirt gatherer, the network of cross-wire spokes precluding rapid cleaning. Of course this feature is not so aggravated in Europe with its smooth old army roads, but when the mud and ruts of most of our roads are considered, the element of dirt becomes an objectionable factor.

"Wire wheels should be furnished on cars we are exporting to England, for commercial reasons. Observation of the last Olympia exhibits showed that the leading makers are furnishing wire wheels as regular equipment or at a slight extra cost. Mr. J. S. Critchley, one of the leading critics of England, at that time stated: 'There is every evidence that wire detachable wheels will become almost a standard with British cars within the next few years. Those who have enjoyed the pleasure of running cars with them would certainly never go back to the old system of fixed wheels.'

"It has been asked, 'Why not furnish the foreign market with American hickory wheels, if they are so superior?' When it is considered that the different models each factory makes necessitate different sizes of wheels, and that we have locally single customers making more cars of one model and one type of wheel than all Europe, it can readily be answered that the foreign market is not profitable.

"The superiority of our wheels depends largely upon the quality of the hickory.

Hickory of proper quality is not a standard commercial article, but a specialty; and cannot be bought in the open market. The wheel-makers are sending their inspectors into the forests to specially select the timber, and to the mills to sort just such stock as is suitable for automobile wheels.

"Many automobile manufacturers are watching the wheel situation because of the persistent rumor that there is likely to be a shortage of hickory. Were this rumor true there would be just cause for alarm. But the fact is that there is a plentiful supply of hickory, the difficulty being to lumber the timber in sufficient quantities during the comparatively short periods of each year in which hardwood lumbering is possible.

"The problem is entirely up to the wheel-maker. It lies with him to meet the scarcity of stock by laying in a large reserve supply. Mr. John Kelsey, who has been in the hardwood lumber business for several years, states that the hickory used in making 200,000 cars a year, namely 12,000,000 spokes and 2,000,000 felloe rims, is simply a drop in the bucket compared with the vast amount of timber in the South, where hard woods predominate, and where there always will be found a liberal percentage of hickory."

C. B. Hayes, who is president of the Hayes Wheel Co., is another of the engineers who made the trip to foreign shores who holds very much the same opinion as does Morley. He, also, witnessed the series of tests which were made, and though he states that "there is no doubt whatever that they were bona fide tests, and that some notice should be given by engineers to the results, no definite steps should be taken until exhaustive tests are made to determine the relative strength of the two types under both dishing and direct loading conditions."

In the paper which he read before the Society of Automobile Engineers he drew particular attention to the fact that the wire wheel is essentially a tension wheel. "It is easily seen," he said, "that any damage to an individual spoke which would throw it out of line and loosen it in any manner whatsoever would immediately throw the wheel out of true. It is a well known fact among engineers that a structure or body made up of tension members only is extremely liable to failure, should one of its members be weakened or damaged in any way. This certainly applies to the wire wheel as well as anything else, and considering the hard knocks and blows that the spokes of a wheel receive under severe road conditions, such punishment would be very likely to render a wire wheel useless. It has been the experience of the writer to note a case of side-collision in which a car with wire wheels was hit on one side and from the impact of the blow given, although on the opposite side of the car, both wheels immediately dished and crumpled up as if built of so much match-

wood. When one member goes, they all go; and a wheel built along these lines is certainly not the economical or safe wheel for the average user of American motor cars.

"The Electric Vehicle Co., of Hartford, experimented for over three years with wire wheels, and, as far as the writer has been able to ascertain, were the largest users of wire wheels in America. Mr. H. P. Maxim, well known to all engineers, was on the engineering force of that company at the time, and experimented exhaustively with the wire type of wheel. The first wheels designed were patterned largely after bicycle wheels, but it was found that the rims were much too thin to hold up under the heavy tension submitted by the small bearing area of the nipples in which the spokes were screwed; it was found necessary to use a very heavy type of rim in order to obviate this difficulty. The spokes were staggered, both in the rim and in the double flange hub, which caused a sidewise motion or thrust to be given at times to the nipples in the rims. It was found in many instances that these nipples, once the spokes had become a trifle loosened, were forced from their seat in the rim and projected through the casing and into the tube of the tire, thereby causing much trouble.

"Looking at a wire wheel on edge, or in the plane of rotation, one may see that the spokes diverge at quite an angle from the rim to the broad hub, in order to provide lateral strength. The wire spokes thus diverging sidewise from the rims are subject to accidents on American roads from which wood spokes, keeping within the rim line, are entirely free. Furthermore, in a skidding smash or accident the wood wheel, even if it breaks, absorbs the shock and saves the machine, but when a wire wheel breaks, as described above, it goes down with a snap.

"The wire spoke where it enters the rim has been found extremely difficult to keep from rusting, and as this is one of the most important points of construction in keeping the wheel true it is naturally a detrimental condition. The problem of keeping a wire wheel clean would be also quite an item with the average American car owner.

"Without considering the problem of weight, compressive strength, etc., the conclusion may be easily drawn that the wire wheel, as now constructed by foreign makers, is not the wheel for the American car, and it is on this assumption that the best wheel manufacturers of the United States today are going ahead with full confidence as to the continued use of the American-made wood artillery wheel.

"The first item that enters into the construction of a wood wheel is, of course, the material. It has been the experience of wheel manufacturers for many years that hickory, either second growth or that part taken from the butt of the small forest tree, is best adaptable to the finer uses of the

wheel manufacturers. Government tests have been made on the different varieties of hickory, of which there are some ten or more, and these experiments have shown that the manufacturers were working along the right lines when they used the so-called black hickory in all cases possible. Hickory in commercial quantities was once found in every State east, and in several States west of the Mississippi river. It has been the opinion of experienced timber buyers that the best hickory is found in and north of the Ohio River valley. The comment one often hears relative to the early failure of the hickory supply is, we think, without foundation, and emanates largely, on the one hand, from hickory users in this country, in their anxiety to keep up the price of their goods, and from foreign wire wheel manufacturers on the other hand. From our observations, extending over the past 25 years, we firmly believe that there will be a good supply of suitable hickory for the manufacturers of automobile wheels when the present generation is gone, as we are now taking hickory from lands that we cut over for hickory 20 years ago, the last cut being of the best quality.

"Hickory should be cut when the sap is entirely out of the tree, and this fact makes the cutting season in the South a very short one; hence, Northern hickory has had a distinct advantage over Southern hickory, and the field in the North is becoming smaller and smaller. Hickory does not and never did form pure forests to any great extent; the trees are scattered here and there amid other timber. Where an average stand of from 200 to 400 feet of hickory is found upon tracts of considerable size it is fully up to the lumberman's expectation. Hickory neither grows like any other commercial timber, nor can it be cut or marketed in the same manner. It is a peculiar wood in vehicle manufacture. It offers supreme resistance to strains, twists and shocks. The severe thrust, twist and compression strains which automobile wheels must sustain demand spokes of absolutely the best material obtainable and for this work the manufacturer depends upon hickory. Hickory has many other uses, uses to which no other wood can be put, and it is the earnest advice of Government foresters that the users of hickory cooperate in methods of buying and cutting, and thus endeavor to utilize every available part of the wood cut.

"Hickory growing in isolated parts of forest tracts, little clumps far apart, has made the cutting and marketing of it one of doubtful profit to the large mill owner of to-day. The men who are cutting hickory are usually found to be those with small portable mills, moving their plant to the wood, in preference to hauling the wood to the mill. These men should be instructed as to how hickory should be cut to obtain the best parts possible for automobile wheels, and also to utilize in the

most economical way the remaining portion of the tree. The best material for spoke billets, rims, etc., is obtained from either second growth stock or from near the base of small forest trees. The sawing is done by mill men who move from place to place. The sawyer is paid by the 1,000 feet, and in his effort to turn out the greatest possible quantity of lumber, carelessly cuts a larger percentage of low grade stock than is necessary. An expert sawyer can probably make it more profitable to the owner of hickory to sell to the wheel manufacturer than to utilize the hickory on his farm for building purposes. The up-to-date manufacturer of automobile wheels must have a force of efficient, practical, competent timber buyers in the field, capable of instructing and demonstrating to the farmer and small mill men the best and most economical way to cut hickory; and in this manner aid materially in the conservation of our hickory resources.

"Hickory billets and strips for felloes are cut by the mill man and shipped to the manufacturer in that condition. The wood is in many instances, in fact, in nearly all instances, green, and necessitates scientific procedure in drying in order to obtain the best possible results from the material. It has been the writer's experience that steam heating is the most satisfactory method of drying the wood; starting in with a low temperature after the kiln is first built, gradually increasing to and holding at the highest point for some time, and then gradually increasing to and holding at the highest point for some time, and then gradually decreasing until the stock is ready to remove. The spoke billets are then taken directly to the turning machine, where they are turned into what is called "dry-lub" state, that is the heads are not faced or mitered, but the barrels are turned to their finished shape. They are then given another course of treatment in the dry kiln, and are then ready for the finishing operation, which consists of mitering, facing, equalizing and sanding. The felloe strips are taken from stock as they come direct from the mill, are steamed, with both exhaust and live steam, bent up to the correct form and then set to remain in dry kilns for 20 to 30 days, as the case requires. They are then ready for the planing, boring, rounding and sanding, after which they are ready for the assembly department.

"The spokes are then driven into the felloes and both halves inserted into a screw press and pressed on to a dummy tub. The wheels are then equalized, that is both halves made of exactly the same height, and the outside circumference is brought down to the correct diameter for the shrinking of the steel band. The steel band is heated, placed around the wood wheel, and the two pressed together in a hydraulic press. The dummy hubs are taken out and the wheel is sanded, primed or oiled, as the case may be, and the hubs and equipment attached.

"It might be well at this point to speak of the construction of the hub. Where the flange meets the barrel on one side of the wheel it is very often rounded, that is the portion of the spoke which rests on the hub barrel and which gives the wheel all its support, is left free along one side before it touches the flange plate. This little open space gives chance for a little play, and the fulcrum which is afforded by the top of the flange and hub plate causes the spoke to work loose in the bolts; this can be avoided easily by designing the flange plates and hub plates so that they meet at a 90-degree angle with the hub barrel.

"The wood artillery wheel put up conscientiously and thoroughly in this manner is an aggregation of compression members only, and as the wheel revolves each spoke receives its share of the direct thrust as the weight of the car comes upon it, and in straight-of-way running this is the only strain that the spokes are called upon to withstand. In going around a corner, however, or insliding or skidding, the spokes are subjected to both tension and shear. As the spoke revolves the principal plane of stress is constantly changing, and instead of a spoke failing at its point of minimum cross-sectional area it fails a trifle toward the outer rim from that point, due to the revolution of the wheel and the angle that the principal plane is made to take with the planes of direct stress. The problem of the exact nature of the stresses on a wheel which is subjected to both longitudinal and lateral forces is a complex one, and time and space will not permit of thorough treatment of the subject at this time. But from the nature of the construction of a wood wheel it is easily seen that the spokes are much more able to withstand the forces indicated acting upon them than is the wire wheel of the type now manufactured.

"There have been made recently rather exhaustive tests on wood artillery automobile wheels at the University of Michigan testing laboratory. These tests were made under the personal supervision of Prof. C. J. Tilden, C. E. Further tests will follow very soon, and reports on the same may be had by writing the S. A. E., or the author. These tests were made on a 22,000-pound Riehle testing machine for both dishing strength and direct loading, the elastic limit and ultimate strength being determined in all cases. The wheels were completely assembled, and the results indicate the relative strength of the different size wood wheels.

How to Temper a Cold Steel Chisel.

It not infrequently happens that a man may want to temper a piece of steel—a cold chisel, or perhaps an improvised tool—but does not know how to go about it. The process, as ordinarily carried out, is not at all difficult. Incidentally, "hardening" and "tempering" are two different things; after the steel has been hardened its hardness is

"tempered" by heat; otherwise it will be too brittle.

To harden and temper a cold chisel, for example, heat an inch or so of its point to a moderate red heat and then plunge it about two inches into cold water, moving it around for a few seconds. Remove it from the water and with a piece of emery cloth on a stick, or a bit of an old grindstone, polish the black skin off the point. As only the point has been cooled—and incidentally hardened "right out"—there will still be a part of the tool, back of the point, very hot. After the chisel is removed from the water the heat will extend to the cooled and polished portion, and as the hardened part becomes hotter it also becomes softer. The colors which indicate the degrees of hardness can be plainly seen chasing each other down the chisel, and when the proper temper has been reached—in this case a rather dark straw color—the whole chisel is again plunged in water or "quenched," and moved about until thoroughly cool. The colors begin with very light shades of yellow, and run down through dark straw-color into purples and browns, and blues, and finally into a very dark blue, in which state the steel is quite soft again.

A chisel so tempered will be hardest near the point or cutting edge and softer and less brittle further back. If the polishing is not done quickly the tempering is apt to extend too far before it can be checked by the "quenching" of the steel, and it then will be necessary to re-heat the tool. This is not desirable, as re-heating injures the quality of the steel if often repeated.

Tempering may also be done by re-heating over the fire, first hardening as already described, only that the whole tool is immersed and moved about in the water until cool, and then polished and heated, for instance by contact with a piece of red-hot iron, until the proper color is reached. The hot iron should be applied at a point well back of the cutting edge so that the softening or tempering will progress in the same way as when the "one-heat" method is used.

Vanadium and Its Effect on Steel.

While nearly every person who does not possess a technical or chemical education imagines that Vanadium steel is an alloy of steel, in which the vanadium imparts hardness and toughness to the steel, this view is far from being correct. True, vanadium steel is harder than ordinary steel, but the toughness and hardness is due merely to the greater purity of the steel. Vanadium remains in the steel only in minute quantities, most of it going into the slag. But it takes with it the last traces of oxygen and oxides of iron, as well as nitrogen, all three of which impurities, but particularly the last, exercise a very bad influence upon the quality of the steel. Their removal makes the steel tougher by allowing the steel molecules to come into closer contact with each other.

WESTINGHOUSE TO MAKE MAGNETOS

Announces Combined Ignition and Lighting Apparatus With Exclusive Features—New Form of Contact Breaker Used.

The Westinghouse Electric & Mfg. Co., well known for its other products of an electrical nature, is preparing to enter the market with a new type of combination low tension magneto and generator. During the continuance of the automobile shows, the device was on private view at the Prince George Hotel in New York City. It incorporates a number of new and exclusive features. The winding is so arranged that at armature speeds corresponding to car speeds of 15 miles an hour the amount of current drawn from the battery for ignition and lighting purposes exactly balances the amount of charging current. At higher car speeds the winding reduces the generator output to the point where the battery is maintained fully charged, but is not subjected to excessive overcharges. A unique type of centrifugally operated automatic switch serves to connect the generator and the battery when the car speed reaches a point sufficient to insure that current is being generated and also disconnects them when the car speed drops below a certain predetermined limit.

By reason of the carrying of an exceptionally high low tension current in the ignition transformer, located on the dash, it has been found necessary to evolve a totally new form of contact breaker in order to reduce the tendency to spark at the contact points. It differs from the usual contact breaker principally in that it has double contacts connected in series. Another of the interesting features of the assembly lies in the use of an ignition plug which cannot be removed except when the ignition current is cut off; the plug also serves as a pole changer, its insertion in either of two ways causing a reversal of current, the effect being to reduce pitting at the contact points. The instrument is supplied in two sizes, large and small, and also as either a combination magneto and generator, or as a plain generator. At present it is manufactured at the company's Pittsburgh plant but machinery, jigs and templates have been forwarded to the Newark, N. J., plant, where its manufacture eventually will be carried on.

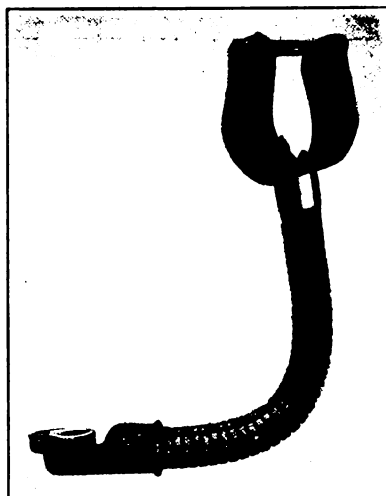
Tensioning the Auxiliary Air Inlet.

The correct tension for the spring on the auxiliary air inlet on a carburetter is found by throttling the motor down as much as possible, then adjusting the spring tension until the valve just stays on its seat. With the motor running at that speed the velocity of the air crossing the jet, if the needle valve be properly regulated, should draw enough fuel to form a proper mixture with

the air drawn through the regular air inlet. As the speed of the engine increases the velocity of the air increases, drawing more gasoline and therefore requiring more air. The auxiliary inlet affords the additional air supply.

For Heating the Carburetter's Air.

Recognizing the value of a supply of warm air to the carburetter as an aid in vaporizing the gasoline as it issues from the spray nozzle, the Breeze Carburetter Co., of Newark, N. Y., has brought out a device for heating air by contact with the exhaust pipe and conveying it to the car-



buretter. While the principle involved in the device is by no means new, carburetter manufacturers frequently supplying hot air attachments suitable for use with their own carburetters and motor car makers installing similar attachments in their cars, this is the first time a hot air connection capable of general application has been placed on the market.

The Col-Mac, as the apparatus is called, consists of a spring brass hood made to fit over the exhaust pipe and held in position by small bolts; a space is maintained between the exhaust pipe and the hood by means of small brass spacing lugs. Flexible metal tubing extends from the hood to the carburetter and is attached to the air intake by means of a clamp, special clamps being made to fit any make of carburetter. When the engine is running air is drawn over the hot surface of the exhaust pipe, between the hood and the pipe, and passes through the flexible tube to the carburetter. The regular outfit includes 18 inches of flexible tubing.

Lubrication of Spring Shackle Bolts.

Spring shackle bolts that are provided with grooves for the distribution of the grease used as a lubricant sometimes turn in their holes so that the grease cannot enter, there being no groove opposite the grease hole. A small dowel pin in the head of the bolt will hold it from turning and permit the lubricant to reach the bearing surfaces.

ALCO SHOWS WHAT TRUCK CAN DO

Puts One of Its Vehicles Through Two Weeks' Non-Stop Test—Some of Its Duties in Express Service.

Continuing its series of demonstrations of just what a motor truck can accomplish when occasion requires, the American Locomotive Co., manufacturer of the Alco truck, put one of its 3½-ton vehicles through another arduous non-stop test which began on January 6th, and continued through the snows and zero weather of the second and third weeks of this month, ending on Saturday last, 20th inst. The truck performed its strenuous task in the service of the United States Express Co., in its metropolitan delivery service, extending to many of the surrounding towns in New Jersey. During the daylight hours the truck was called on to deliver packages in the residential sections of the towns on the Jersey side, while during the nights the duty shifted to transferring heavy loads between the express company's headquarters in Hoboken and the Central Railroad of New Jersey at Communipaw.

Performing such varied duties as these, the vehicle transported an average of 31,510 pounds of merchandise a day, averaging 66 miles, 14 trips, and 92 stops for collecting and distributing its cargo. The best record for a single day was 86 miles, and the largest number of trips was 22. The high mark in stops, 104, was made on the first day of the run, and on January 17 the truck hauled its heaviest day's loads totaling 43,978 pounds. An average of one gallon of gasoline to an hour of service was maintained.

The total number of miles covered during the two weeks of duty was 922, and all told 198 trips and 1,284 stops were made. The entire number of pounds hauled throughout the period was 441,136.

Can't Smoke—So They Use Snuff!

In London, where wise men regularly make "discoveries" of unusual "crimes" or other effects due to automobiles, one of these wisecracks just has found that they are responsible for an extraordinary increase in the sale of snuff during the year 1911. A "Snuff Club" is said to have been formed in the English capital and as nearly 90 per cent. of its members are motorists, hence the responsibility of the automobile. Speaking of the situation, the leading tobacco dealer in Piccadilly is quoted as asserting that he is selling about three pounds of snuff more per week than last year. "Many of my customers," he is made to say, "are motorists. They take snuff partly because cigarette, cigar or pipe smoking is unsatisfactory in the open air and partly because snuff cleans out the nostrils after a dusty journey."



INDEX TO ADVERTISERS



A		H		O	
Abbott Motor Co.....	614	Hartford Auto Parts Co.....	602	Oakland Motor Car Co.....	478
Adamson Mfg. Co.....	610	Hartford Suspension Co.....	585	P	
Ajax-Grieb Rubber Co.....	503	Havers Motor Car Co.....	511	Packard Electric Co.....	615
Alpena Motor Car Co.....	476-77	Hayes Mfg. Co.....	601	Parish Mfg. Co.....	561
American Ball Bearing Co.....	583	Haynes Automobile Co.....	507	Perfection Spring Co.....	561
American Motors Co.....	612	Henderson Motor Sales Co.....	614	Petrel Motor Car Co.....	611
American Starter & Carburetor Mfg. Co.....	611	Hot-Spark Plug Co.....	513	Pittsfield Spark Coil Co.....	471
Anderson Electric Car Co.....	490	Hupp, R. C.....	492-493	Pullman Motor Car Co.....	611
Anderson Spark Plug Co.....	561	Hupp Motor Car Co.....	502	Q	
Apple Electric Co.....	561	Hyatt Roller Bearing Co.....	593	Queen Manufacturing Co.....	594-95
Argo Electric Vehicle Co.....	500	I		Quimby, J. M., & Co.....	560
Atwater-Kent Mfg. Wks.....	491	Ideal Motor Car Co.....	613	R	
Automobile Supply Mfg. Co.....	499	Ignition Starter Co.....	550-51	Rajah Auto Supply Co.....	615
B		Inner Shoe Tire Co.....	586	Remy Electric Co.....	609
Badger Brass Mfg. Co.....	610	International Accessories Corp.....	607	Royal Equipment Co.....	582
Barthel, Daly & Miller.....	616	Inter-State Automobile Co.....	613	S	
Bartholomew Co.....	608	Invincible Starter Co.....	494	Sackman Mfg. Co.....	610
Bicycling World & Motorcycle Review	600	J		Safety Tire Gauge Co.....	561
Bosch Magneto Co.....	609	Jamestown Wheel & Mfg. Co.....	561	Salisbury Wheel & Mfg. Co.....	610
Bossert Co.....	561	Jeffery-DeWitt Co.....	504-05	Sampson, Alden Mfg. Co.....	496
Bower Roller Bearing Co.....	497	Jeffery, Thomas B., Co.....	613	Schrader's Son, A., Inc.....	605
Bretz, J. S., Co.....	510	Johns-Manville, H. W., Co.....	609	Selden Motor Vehicle Co.....	616
Briggs-Detroit Co.....	482	Jones Speedometer.....	615	Shaler, C. A., Co.....	581
Briscoe Mfg. Co.....	606	K		Shawmut Tire Co.....	610
Brown-Lipe Gear Chapin Co.....	615	Kellom, Chas. F., & Co.....	561	Smith, A. O., Co.....	584
Brush Runabout Company.....	496	Kinsey Mfg. Co.....	603	Sparks-Withington Co.....	487
Briggs & Stratton Co.....	501	Kinsler-Bennett Co.....	611	Speedwell Motor Car Co.....	620
Bush Mfg. Co.....	561	Kissel Motor Car Co.....	470	Splitdorf, C. F.....	F. C.
C		Kline Motor Car Corp.....	616	Springfield Metal Body Co.....	561
Cartercar Co.....	481	Knox Automobile Co.....	614	Standard Roller Bearing Co.....	561
Century Electric Car Co.....	565-66-67-68-69- 70-71-72-73-74-75-76-77-78-79-80	L		Standard Oil Co.....	604
Champion Ignition Co.....	602	Lauth-Juergens Motor Car Co.....	603	Standard Tire Protector Co.....	587
Champion Spark Plug Co.....	608	Leather Tire Goods Co.....	561	Standard Welding Co.....	515
Church-Field Motor Car Co.....	606	Legnard Bros.....	605	Stearns, F. B., Co.....	613
Clark-Carter Automobile Co.....	613	Lewis Spring & Axle Co.....	598-99	Stewart & Clark Mfg. Co.....	591
Classified Advertising.....	559	Locomobile Company.....	561	Streator Motor Car Co.....	512
Colby Motor Co.....	614	Lovell-McConnell Mfg. Co.....	Inside B. C.	Stromberg Motor Devices Co.....	473
Colonial Electric Car Co.....	562-63	M		Studebaker Corp.....	480
Columbia Motor Car Co.....	496	Mais Motor Truck Co.....	611	Swinehart Tire & Rubber Co.....	592
Columbia Motor Car Co.....	496	Manhattan Electrical Supply Co.....	604	T	
Continental Motor Mfg. Co.....	488-489	Manufacturers Foundry Co.....	612	Thomas, E. R., Motor Car Co.....	561
Corbin Motor Vehicle Co.....	614	Marion Sales Co.....	614	Timken Roller Bearing Co.....	495
Covert Motor Vehicle Co.....	479	Marquette Co.....	484	U	
Cramp, Wm. & Sons, Ship & Engine Building Co.....	615	Maxwell-Briscoe Motor Car Co.....	496	Union Sales Co.....	611
Crosby Company.....	612	Mayo Radiator Co.....	471	United Rim Co.....	514
D		McIntyre, W. H., Co.....	611	U. S. Auto Horn Co.....	610
Dayton Motor Car Co.....	496	Metz, C. H.....	614	United States Motor Co.....	496
Dayton Rubber Mfg. Co.....	590	Metzger Motor Car Co.....	472	United States Tire Co.....	Inside Cover-469
Dean Electric Co.....	485	Michelin Tire Co.....	615	V	
Diamond Rubber Co.....	608	Michigan Buggy Co.....	614	Velie Motor Vehicle Co.....	604
E		Miller, Chas. E.....	588-89	W	
Eisemann Magneto Co.....	483	Moline Automobile Co.....	597	Warner Gear Co.....	615
Electric Welding Products Co.....	608	Mosler, A. R., & Co.....	561	Warner Instrument Co.....	609
Empire Tire Co.....	612	Moss Photo Engraving Co.....	604	Weed Chain Tire Grip Co.....	596
F		Motor Car Equipment Co.....	561	Western Motor Co.....	616
Faries Manufacturing Co.....	612	Motor Wagon Co. of Detroit.....	618-619	Weston-Mott Co.....	474-75
Federal Rubber & Mfg. Co.....	506	Motor World Publishing Co.....	617	Wetherill Finished Castings Co.....	616
Fedders Mfg. Co.....	610	Mott Wheel Works.....	616	Whitney Mfg. Co.....	607
F. I. A. T.....	610	Motz Tire & Rubber Co.....	561	Willys-Garford Sales Co.....	B. C.
Firestone Tire & Rubber Co.....	612	N		Willys-Overland Co.....	516
Fisk Rubber Co.....	498	National Motor Vehicle Co.....	608	Winton Motor Car Co.....	613
Ford Motor Company.....	611	New Departure Mfg. Co.....	564	Wisconsin Motor Mfg. Co.....	604
G		New Process Rawhide Co.....	612		
Goodyear Tire & Rubber Co.....	561	Nordyke & Marmon.....	613		
Gray & Davis.....	486	Not-A-Crank Gas Engine Starter Co., 508-09			
Grossman, Emil, Co.....	615				

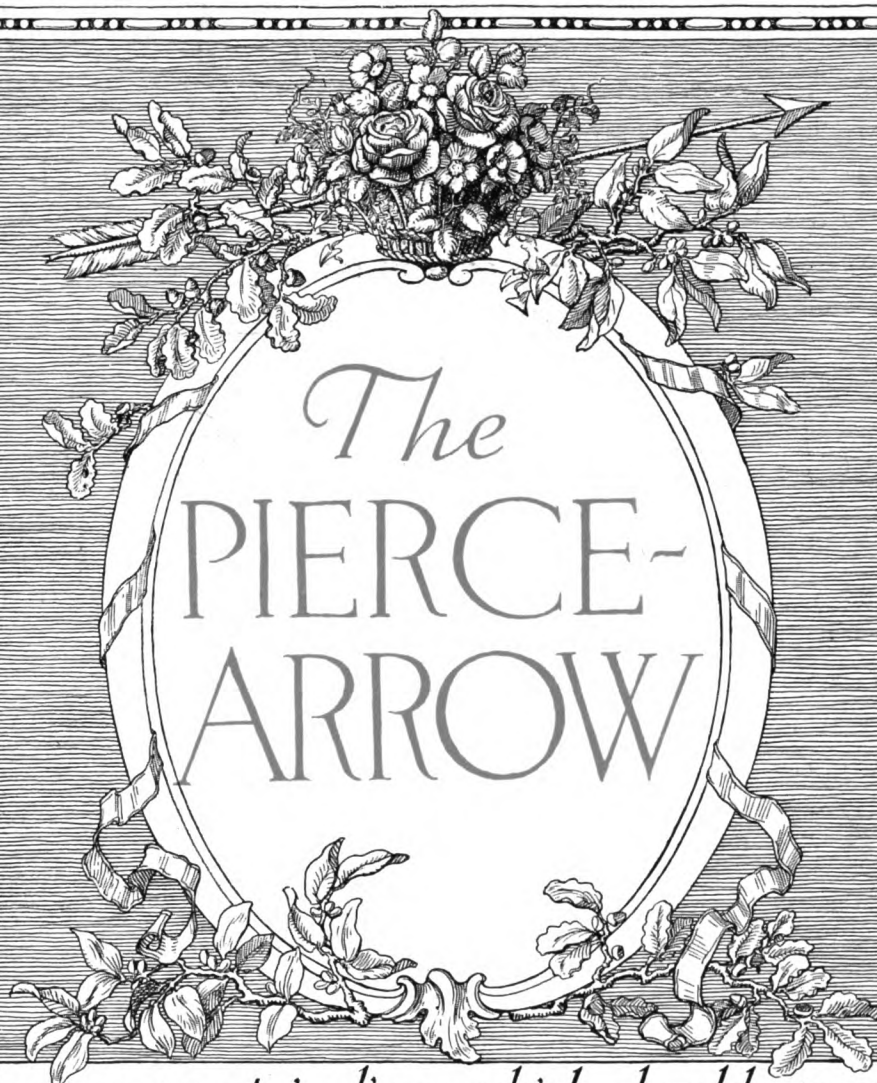
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 6

New York, February 1, 1912

Ten cents a copy
Two dollars a year



There are certain lines which should go with the building of an automobile body, just as there are certain lines that go with the building of a yacht. In the PIERCE-ARROW CARS for 1912 the automobile body has come into its own. These bodies have been built as automobile bodies—not as adapted carriage bodies. You will see the great difference at once.
The PIERCE-ARROW MOTOR CAR CO., BUFFALO, N.Y.

Chicago Show Number—Pleasure Cars

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Dealers—Do you realize the importance of your sundry line?

No matter how great the volume of your sales, there is no ~~one~~ branch of your business in which there are ~~greater possibilities than~~ in sundries.

In the first place this is a money-making line. While the returns from individual sales may be small the aggregate is big.

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And the motorist learns to rely on you for service.

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Our line includes every article needed in connection with tires, from pressure gauges to casing protectors.

Have you seen the

Chain Tread Tire?

This was one of the most talked-about tires at the shows.

It is the latest addition to the United States Tire Line.

Literature and Detailed Information on Request.

UNITED STATES TIRE COMPANY

Broadway at 58th Street, New York

THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, February 1, 1912.

No. 6

METZGER REMAINS N. A. A. M. HEAD

Chosen to Succeed Himself, While C. C. Rice Replaces Innes as Treasurer—All Other Officers Re-elected.

William E. Metzger, president of the National Association of Automobile Manufacturers, who, in rendering his report at the annual general meeting of the organization in New York, three weeks ago, stated his belief that there was now room for but one organization of automobile manufacturers, and who expressed the hope that his "successor would be able to say at the end of his term that the N. A. A. M. is the only organization making a claim to national importance or assuming to carry on the work for which the association was organized," has been placed in position to say, twelve months hence, whether or not this hope has been attained. For at the annual meeting of the executive committee of the N. A. A. M., which occurred in Chicago yesterday, 31st ult., Metzger was chosen to succeed himself as the head of the association.

Excepting W. R. Innis (Studebaker), who had served as treasurer for so many years, all of the other officers were re-elected. Mr. Innis was succeeded by C. C. Rice, of the Nordyke & Marmon Co. The official slate for the ensuing twelvemonth therefore stands as follows:

President, William E. Metzger, Metzger Motor Car Co.; first vice-president, Benjamin Briscoe, United States Motor Co.; second vice-president, H. O. Smith, Premier Motor Mfg. Co.; third vice-president, S. T. Davis, Jr., Locomobile Co. of America; secretary, R. D. Chapin, Hudson Motor Car Co.; treasurer, C. C. Rice, Nordyke & Marmon Co.

The executive committee, which was elected at the general meeting in New York last month, consists of Messrs. Metzger, Briscoe, Smith, Davis, Chapin, Rice and Windsor T. White, White Co.; Chas. Clifton, Pierce-Arrow Motor Car Co.; A. L.

Pope, Pope Mfg. Co.; S. D. Waldon, Packard Motor Car Co.; L. H. Kittridge, Peerless Motor Car Co.; Alfred Reeves, United States Motor Co.; G. W. Bennett, Willys-Overland Co.; Hugh Chalmers, Chalmers Motor Co.

Fight for Name "Hupp" Amicably Settled.

The suit of the Hupp Motor Car Co. against R. C. Hupp and his brother and the Hupp Corporation, designed to prevent the Hupp brothers from employing their family name in their new business, was amicably settled yesterday, when a consent decree was entered in the Detroit court. It does not go into the merits of the case, but according to its terms the Hupp Corporation will change its title to R. C. H. Corporation, and the Hupp brothers agree not to employ their names in connection with any corporation, although they retain the right to use them in individual business or as a partnership. They are also permitted to use their names as officers of the R. C. H. Corporation, but R. C. Hupp binds himself not to make any written or printed statement that he has been the manufacturer of the Hupmobile. On its part the Hupp Motor Car Co. will pay to the Hupp brothers \$50,000 that is due them.

Stoddard Resigns Office in U. S. Motor.

C. G. Stoddard, first vice-president of the United States Motor Co., has resigned that office and also relinquished the chairmanship of the operating council, which comprises the heads of the various departments of the big corporation. The latter position has been assumed by O. S. Goan. Although relieving himself of official cares, Mr. Stoddard remains a director of the United States Motor Co., as does his father, J. W. Stoddard.

Disco Removes to Larger Headquarters.

Its growth during the past six months having been akin to the strides made with seven league boots, the Ignition Starter Co., of Detroit, maker of the Disco engine-starter, has removed its main office from the Ford building to the Dodge-Power building, 206 Jefferson avenue, Detroit.

SPRING WHEEL GAINS RECOGNITION

Johns-Manville Contemplates Manufacture of Frey-Doty Invention—Big Car Makers Also Reported Interested.

For the first time since the spring wheel was invented and heralded as a rival or possible, or probable, substitute for pneumatic tires, an established company of national reputation and importance has become sufficiently interested to take a wheel of the sort in hand and seriously to contemplate its manufacture.

The company which by this action gives to the spring wheel a dignity and consideration it always has lacked is none other than the H. W. Johns-Manville Co., of New York, which is world-famous because of its asbestos manufactures and is closely identified with the automobile industry because of its asbestos brake lining material.

And of the 13,000 spring wheels which, according to the records of the Patent Office, have been invented, the one which has attained to this unusual distinction is that invented by Erwin Frey, of New York, which is covered by patent No. 982,047, issued January 17, 1911, which patent, however, is controlled by C. L. Doty, who for the past nine years has been identified with the Fourth National Bank of New York, most of the time performing special service for its president, James G. Cannon, who, it so happens, is a director of the Johns-Manville Co., while Mr. Manville in turn is a director in the Fourth National Bank. It was this relationship that enabled Doty to enlist the attention and support of the Johns-Manville interests.

Mr. Manville himself is tremendously interested in the Frey invention, and sees for it a large future, but while admitting that his company has the wheel in hand and seriously contemplates its manufacture and marketing, it cannot be stated, with all definiteness, that the decision to do so has been reached, nor is the Johns-Manville company in position to deal with inquirers

or possible purchasers. It probably will be 60 days before a definite decision will be rendered.

Meanwhile, the Frey-Doty wheel is being subjected to continued strenuous tests, not merely by the Johns-Manville interests, but by an automobile manufacturer whose size and importance are beyond question, and mention of whose name probably would in this connection create a sensation were it given. It is known that he thinks so well of it that if further tests bear out first opinions he contemplates the adoption of the spring wheel as standard equipment for at least one of his several models.

Essentially the Frey-Doty invention comprises two separate felloes, spiral springs being placed between the inner and outer felloe, in the former of which is ingeniously incorporated a smaller spring placed transversely, and designed to allow of lateral movement of the main spring guide rods. It is substantially described by the first two claims of the patent, which comprises 72 claims, and which are as follows:

1. In a vehicle wheel, the combination with an inner member and an outer tread member, of means for connecting the tread member yieldingly to the inner member and including a plurality of rods, devices extending from opposite sides of each rod loosely mounted in said inner member comprising a head portion engaging a part of said rod, a stem portion slidably held in the inner member and a cup-shaped portion at the opposite end of said stem, and springs interposed between the opposite cup-shaped ends of the said devices.

2. In a vehicle wheel, the combination with an inner member and an outer tread member, of means for connecting the tread member yieldingly to the inner member, devices extending from opposite sides supporting means loosely mounted in said inner member comprising a head portion engaging a part of said tread supporting means, a stem portion slidably held in the inner member and a cup-shaped portion at the opposite end of said stem and springs interposed between the opposed cup-shaped ends of said devices.

General Motors Merges Foreign Interests.

Bedford Motors, Ltd., of London, and the other foreign interests of the General Motors Co. have been consolidated and taken over by a new corporation, General Motors, Ltd., which just has been brought about as a result of the visit of O. G. Bennett, vice-president of the General Motors Export Co., who has been in Europe for the past two months. General Motors, Ltd., has been incorporated to do business in the British Isles, Continental Europe, Scandinavian Peninsula, European Russia, North Africa, India, Burma, Malay Peninsula, and the British and Dutch East Indies, and will market the American cars made by the parent General Motors Co., in all of those countries.

FLANDERS POT KEEPS A-BOILING

His Second Lieutenant Visits Indianapolis and Apparently "Spills the Beans"—Mysterious "Six" in New Deal.

Whether someone "spilled the beans," to employ the vernacular, remains to be seen, but at any rate the semi-mysterious six-cylinder car developed by Walter E. Flanders's Commercial Engineering Co., of Detroit, figuratively speaking, has poked its nose into Indianapolis. Ten days ago those who know a thing or two were aware that after being shifted from Detroit to Milwaukee, it was headed in that direction. Paul Smith, who is sales manager for the Studebaker Corporation, of Detroit, of which Flanders is general manager, is the man who, wisely or otherwise, "spilled the beans," permitting the change of direction to become generally known.

In addition to being the Studebaker sales manager, Smith, is also Flanders's personal left bower. Before going to Detroit he lived in Indianapolis. He revisited his old home one day last week and surface indications at least tend to show that an Indianapolis newspaper man learned of his presence and of his interest in six-cylinder cars. The newspaper man certainly printed a story that Smith was contemplating going into the automobile manufacturing business on his own hook, and that his factory might be located in Indianapolis. Indeed, he went so far as to put in black and white that in his new venture Smith will be backed by B. F. and Henry Kramer, of Mudlavia Springs, which is one of Indiana's several health resorts; also that "friends of Smith said he was talking to them of turning out a six-cylinder car of both pleasure and commercial pattern;" likewise that during his visit to Indianapolis, "Smith, it is said, made arrangements with an engine company to furnish him with specifications for a six-cylinder engine embodying new ideas," which latter statement does not wholly jibe with understandings that exist elsewhere. The Indianapolis newspaper man stated that "when Smith was asked about his venture he declined to admit that such a project was in contemplation," but the reporter felt moved to inject into his story that "there is a suspicion that Walter Flanders is also behind Smith."

The Indianapolis paper did not so state, but it is known that after Smith returned to his duties in Detroit, Fred I. Tone, engineer of the Marion Motor Car Co., and of the Federal Motor Co.—the latter of which makes engines and which is located in Indianapolis,—journeyed to the Michigan city and kept an appointment with Paul Smith. During the course of his visit he was introduced to Flanders and other men identified with the Flanders interests, with whom he spent the day in earnest conver-

sation. There are reasons for believing that they discussed six-cylinder cars, among other things, and that within just about 30 days the reasons for Smith's visit to Indianapolis and Tone's visit to Detroit will be made fairly plain.

Whether Paul Smith's six-cylinder car will bear the name "Flanders" is an open question. In view of the extensive exploitation of that name in the Studebaker advertising and other Studebaker printed matter, and by Studebaker employes, the belief is current in certain circles in Detroit that applied to a six-cylinder car, even in Indiana, it would cause a quick flow of large dollars in certain directions.

Meanwhile, Flanders and Smith remain connected with the Studebaker establishment in Detroit, but Flanders has not yet despaired of bringing about the merger of his own Flanders Mfg. Co. and the Universal Truck Co., which merger struck a snag in the process of merging. It is now said that the Commercial Engineering Co. and its six-cylinder car entered into those negotiations, but that proposals from Indianapolis made it appear more desirable, or more advisable, to heed the voices from that direction. As a result, the Flanders-Universal proposition has been rearranged on a new basis and fresh sets of figures have been prepared for the edification of those who are parties to the transaction.

To Make Wagons and Investors' Models.

With an "inventors' department" as one of its proposed features, the General Industrial and Manufacturing Co., capitalized at \$1,000,000, has been organized in Indianapolis, Ind., and was incorporated last week under the laws of that State. F. B. Laycock is president of the company, which will take over the power house building of T. B. Laycock Co., in Indianapolis. In addition to Laycock, the directors of the company are C. E. Coffin, W. J. Mooney and I. N. Richards, of Indianapolis, and E. W. Bowen, of Lebanon, Ind. It is the intention to manufacture a line of light delivery wagons, up to 1,500 pounds capacity, but they will not be ready in season for this year's market. The "inventors' department" which it is proposed to establish, "will be open to use of individual inventors for a nominal fee," the General Industrial and Manufacturing Co. proposing to make a specialty of producing inventors' models; likewise several specialties of which it already has control.

Ohio Men in Ontario Tire Project.

According to advices from Owens Sound, Ont., the mayor of that city has entered into an agreement with the Aetna Rubber Co., of Cleveland, O., whereby the latter "is to erect a large factory for the manufacture of automobile tires and rubber goods." The Aetna Rubber Co. is not readily identifiable but E. D. C. Bayne is named as its president, and E. E. Trash as its secretary-treasurer.

CREDIT ASSOCIATION CHOOSES COHN

New York Horn Manufacturer Takes the Helm—Few Other Changes Made—Summary of Work Performed.

J. J. Cohn, of the Nonpareil Horn Manufacturing Co., New York, was elected president of the Automobile Trade Credit Association at the meeting which occurred in New York on the 24th ult. He succeeds Carl Kaufman, of the Motor Car Equipment Co., who, however, succeeds himself as a member of the board of directors for a three-year term. All of the other officers were re-elected, viz.: vice-president, W. B. Lashar, of the Weed Chain Tire Grip Co.; treasurer, M. J. Martin, of George A. Haws; secretary and counsel, Frank Neilson. In addition to Kaufman, Arthur Waterman, of the Hartford Suspension Co., and U. S. Kolby, of the American Ever Ready Co., were elected directors for three year terms, Kaufman and Waterman being re-elected and Kolby succeeding E. C. Wilcox, of the Connecticut Telephone and Electric Co. The hold-over directors are W. O. Turner, of the Lovell-McConnell Mfg. Co.; M. J. Martin, of George A. Haws; J. J. Cohn, of the Nonpareil Horn Manufacturing Co., and F. A. Lemal, of the United States Tire Co.

At the meeting two new members were added to the roll: The Waterbury Welding Co., of Waterbury, Conn., and the Marshall Oil Co., of Marshalltown, Ia.

The secretary's report showed that during the year 60 new members had been enrolled and that more than 4,500 separate complaints against delinquent creditors had been handled. They involved claims amounting to \$240,000, of which, through the efforts and influence of the association, 3,000 were settled or adjusted, the total amount of such adjustments reaching \$160,000. These figures represent an increase of 43 per cent. in the number of complaints handled, and 53 per cent. in the number adjusted.

In addition to the other work performed during its six years' of existence, the association has issued more than 4,000 warnings respecting debtors who failed to adjust their claims, or to show good reason why they should not be "posted" as "poor pay." Of the 4,000 affected, upwards of 1,500 have not yet cleared themselves.

Board of Trade Against "Annual" Models.

It came out this week that at its October session, the Automobile Board of Trade adopted a motion making it the sense of the meeting that manufacturers discontinue the designation of yearly models in catalogs and general advertising. Knowledge that such action had been taken, however, might not have become public had not W. C. Shepherd, president of the Matheson Au-

tomobile Co., issued a statement last week remarking the fact and emphasizing the action of his company in having placed itself in opposition to the season model practice more than a year ago.

Price of Gasolene Again Going Up.

The price of gasolene is going up, or rather has gone up. It was advanced one cent per gallon on Saturday last, and now stands at 11 cents. This is the second increase that has been made within the past three months, one cent having been added to the price early this winter. At that time, nine cents per gallon was the figure.

When asked the reasons for the increase, J. I. C. Clarke, publicity manager for the Standard Oil Co., stated yesterday that the nine cent price was brought about by the great increase in the production of gasolene, but that this increase has not kept pace with the demand, the growing use of motor trucks, motor fire apparatus, etc., being so heavy that the law of supply and demand necessitated the present advance to 11 cents. Clarke, however, was particularly anxious that it be emphasized that even the present quotation is one cent less than obtained three years ago, when the price was 12 cents a gallon wholesale.

Brings Suit on Baker Front Axle Patent.

Suit has been instituted in the United States District Court for the Northern District of Ohio by the American Ball Bearing Co., of Cleveland, against the Metal Products Co., of Detroit, for infringement of patent No. 753,820, which covers a front axle invented by W. C. Baker, president and mechanical engineer of the Ball Bearing company. Some time ago the latter instituted action against the Standard Roller Bearing Co., for infringement of the same patent, but the case was settled out of court, the defendant deeming it best to recognize the validity of the patent, and to take out a license to operate under it.

Stevens-Duryea Secures New Factory Site.

Due largely to the growth of its business and partly to certain advantages offered by the new locality, the Stevens-Duryea Co. has acquired a forty-acre tract in East Springfield, Mass., which is within hailing distance of Chicopee Falls, and as soon as weather conditions will permit will begin the erection of a new plant on the East Springfield site. It is expected that the first of a series of buildings which will be constructed will be ready by June 1st next. It will be a four-story structure, 500 feet long by 80 feet wide, containing a floor area of 160,000 square feet.

McCue Begins Making of Wire Wheels.

The McCue Co., of Buffalo, N. Y., which heretofore has confined itself to the manufacture of axles, has added wire wheels to its productions. The McCue wheel is of the detachable type provided with a ratchet locking device.

AMERICANS OBTAIN RIGHTS TO WORM

Ohio Makers Close Deal With Lanchester During Visit Abroad—American Ball Bearing Gets Axle License.

Gradually it is being made plain that not all of the members of the Society of Automobile Engineers who comprised its recent European party went abroad wholly to "see things." Some of them, at least, went abroad with well-defined intentions of doing things, and did them. Among the number were Charles E. Davis, general manager of the Warner Gear Co., of Muncie, Ind., and W. C. Baker, president and mechanical engineer of the American Ball Bearing Co., of Cleveland, O. They had their minds set on the worm gear and before they returned they had placed themselves in position not merely to promote the American demand, but to meet any demand that may arise.

Mr. Davis, on behalf of the Warner company, contracted with the Daimler Motor Co. and F. W. Lanchester for the exclusive rights to the Lanchester worm and worm wheel for the United States and Canada, while the American Ball Bearing Co. in turn has completed a contract with the Warner Gear Co. which confers on the Ball Bearing company the sole right, as axle manufacturers, to employ this type of drive.

The Lanchester worm, which probably is the best known of several types in use abroad, is of the design commonly known as the envelope or hour glass type. It is distinct, however, from all others in that the Lanchester machinery and cutters employed in producing it, entirely eliminate all hand-finishing operation and leave the gear absolutely true in tooth form.

The Daimler and the Lanchester Motor Car companies have been using the gear for several years and recently adopted it exclusively for their entire outputs, the two companies having worked in conjunction in perfecting it. In addition to the Daimler and Lanchester cars, it is used by the makers of the Panhard, Minerva and other well-known foreign productions.

Mr. Baker, to whom is given the credit of constructing the first bevel gear driven automobile axle produced in this country, is thoroughly convinced of the mechanical practicability of the worm gear, as applied to motor vehicles, and believes, as the action of his company indicates, that it is destined to cut a large figure in the industry.

"While abroad," he said, "I investigated the various other types of worms and gears in use and was especially impressed with the fact that in the Lanchester type there is obtained, without hand-fitting, a maximum of surface contact, which, in my opinion, is in a large measure responsible for its unqualified success."

The matter of properly mounting the

worm and gear so as to hold them absolutely rigid in the axle construction is of vital importance and received Mr. Baker's careful consideration.

"I was gratified to find," he added, "that our own manufacturing practice is so far advanced that the adoption of the Lanchester worm and gear in our axle construction will require no modifications or changes; the two harmonize perfectly."

The fact that the Warner and the American Ball Bearing Co. have consummated a contract which is fraught with so much significance to the American industry was kept so quiet that practically nothing was known of it until the Ball Bearing company for the first time displayed a worm driven axle at the New York show last month, and even then, strange to say, it escaped the notice of many.

European Manufacturers Get Together.

While there is no knowledge that American automobile manufacturers had been invited to participate in the proposed organization, it appears that at the time of the international automobile show at Brussels, Belgium, last month, there was formed the International Association of Automobile Manufacturers (Union Internationale des Constructeurs d'Automobiles), in which five countries are represented. France, Germany, Belgium, Great Britain and Switzerland sent representatives to a meeting at Brussels on January 15th, and elected the following officers of the International organization: President, Armand Peugeot (France); vice-presidents, Count Liederkerke (Belgium), Mr. Manville (England) and Dr. Fisher (Germany); secretary-treasurer, M. H. Cezanne.

Kennedy Succeeds to Ohio's Secretaryship.

At the annual meeting of the Ohio Motor Car Co., of Cincinnati, last week, C. M. Anderson retired as secretary in order to engage in business on his own account at Middletown, O. He was succeeded by Robert Kennedy. All of the other officers were re-elected, as follows: Charles F. Pratt, president and general manager; A. E. Schafer, vice-president and factory manager; O. M. Bake, treasurer. R. E. Northway, chief engineer; H. T. Boulden, sales manager, and C. E. Evans, assistant factory manager, also retain their respective offices.

Two Franklin Companies Re-elect Officers.

At the annual meeting of the H. H. Franklin Manufacturing Co., in Syracuse, N. Y., last week, H. H. Franklin was re-elected president. The other officers are: G. H. Stilwell, vice-president; F. A. Barton, secretary and treasurer; H. H. Franklin, G. H. Stilwell, F. A. Barton, A. T. Brown, W. C. Lipe, E. H. Dann and John Wilkinson, directors. Mr. Franklin was also re-elected president of the Franklin Automobile Co., which is the selling company for Franklin cars, and which, of

course, is a twin brother to the H. H. Franklin Manufacturing Co. The other officers of the Franklin Automobile Co. are: Vice-president, John Wilkinson; F. A. Barton, secretary and treasurer; H. H. Franklin, John Wilkinson, F. A. Barton, G. H. Stilwell and E. H. Dann, directors.

Year's Exports Approximate \$20,000,000.

Departing from usual custom, and in advance of the detailed statement which is issued each month, the Department of Commerce and Labor late last week announced that the total exports of automobiles, parts and tires during the year 1911 amounted to \$23,479,861, which amount, however, includes \$1,483,165 which were sold in the Philippines, Hawaii, Porto Rico and Alaska, and therefore do not truly rank as exports. The total amount also includes tires to the amount of \$2,500,000 in round figures, of which until last year no account was taken. Minus these two latter items, the exports of cars and parts will fall short of the \$20,000,000 figure. For the year 1910 the exportations, tires excluded, attained a total value of \$14,030,226, the gain during 1911 being, therefore, just short of 50 per cent.

Changes Made in Seitz Directorate.

H. A. Kring and August Loeffler who about a year since acquired an interest in the Seitz Automobile and Transmission Co., of Wyandotte, Mich., have resigned as directors of the company and purchased its steel foundry. They however, still retain part of their stock in the Seitz company, whose directorate now comprises W. A. Seitz, John P. Seitz, J. C. Kern, H. C. Wilmer and Frank Manx, a Wyandotte brewer, the new order of things giving the Seitzes and their immediate associates control of the property. They have taken possession of their new plant in Wyandotte, which is about 17 miles from Detroit, and are producing two trucks a week, of one, two and three-ton capacity, the 1,500-pound vehicle having been discontinued.

Studebaker Discontinues Denver Depot.

The Studebaker Corporation to-day will discontinue its wholesale depot in Denver, which has been conducted by the Studebaker-Colorado Vehicle Co., of which Nelson Studebaker Riley was general manager. The warehouse in that city will be sold and the traveling men that covered the territory hereafter will report to the factory at South Bend, Ind. The retail store, however, will be continued under the management of A. M. Williamson. Riley himself will go to Kansas City to take charge of the Studebaker business there, where previously he was located.

Fight For Stock Leads to Litigation.

Due to an internal fight for the possession of 2,000 shares of stock in the Service Motor Car Co., of Wabash, Ind., Burton C. Lindley and Menla J. Knox have filed a bill

in the United States District Court in Chicago, asking that the company be restrained from disposing of the stock. The complainants allege that the company has failed to live up to contracts entered into with Charles S., Burton F. and Ford Reiman and William O. and John D. Worth, which contract the bill recites was entered into to settle the dispute over the sale of the stock.

To Produce Visible Plugs in Detroit.

The Visible Spark Plug Co., of Detroit, which just has been incorporated under the laws of Michigan with \$10,000 capital stock, will market a high grade plug which is characterized by a self-contained spark gap. The central electrode is encased in a transparency, there being an opening in the porcelain which permits the action of the spark to be seen without removal of the plug from the engine. The officers of the new company are Albert E. Sherman, president; Edward J. Fox, secretary, and Mark W. Hearn, treasurer.

Moves Poppet Valve Plant to Detroit.

W. E. Carpenter, who was general manager of the Hibbard Engineering Co., which dealt in automobile materials in Detroit, has purchased the Schlieder Manufacturing Co., of Buffalo, and removed the plant to 45 Fort street, East Detroit, where the manufacture of the Schlieder new process poppet valves will be continued. The Schlieder valves were among the articles which previously were handled by the Hibbard Engineering Co.

Three Disco Branches on Pacific Coast.

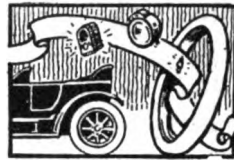
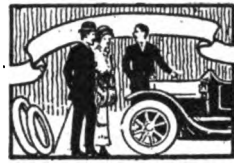
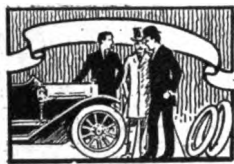
The Disco Pacific Co., of San Francisco, which recently was organized to distribute the Disco engine starter on the Pacific coast, has established branches in Los Angeles and Seattle. The former is in charge of George O. Seeley, who is president of the company, while H. G. Seeley is manager of the Seattle establishment. The San Francisco office is managed by N. E. Canfield.

Connecticut Locates New York Branch.

The Connecticut Telephone and Electric Co. and the Connecticut Shock Absorber Co., of Meriden, Conn., which are closely related, have opened New York offices and salesrooms of their own at 231 West 54th street, where full stocks of both the Connecticut ignition devices and Connecticut shock absorbers will be carried. Heretofore both companies have been represented in New York by sales agents.

Jeffery-DeWitt Opens New York Branch.

The Jeffery-DeWitt Spark Plug Co., of Detroit, which is one of the largest producers of spark plugs in the world, has opened a New York branch at 1789 Broadway, from which establishment the entire Eastern territory hereafter will be handled. It follows, of course, that the establishment will carry stocks of Reliance and J-D plugs.



Karl H. Helm, of Pittsburgh, has opened a garage on F street, Chula Vista, Cal.

Frank W. Peck has broken ground for a garage at William street, Rochester, N. Y.

W. A. Blumenthal is building a fireproof garage at 53 Thorndike street, Brookline, Mass.

The Buchanan Automobile Co. has "opened up" at Robeson, Pa. Donald L. Buchanan is president.

A. F. Lauzon & Co. have opened a garage at 100 South Winooski avenue, Burlington, Vt. They will handle the R. C. H. cars.

Fred Cramm, of Bushton, Kans., has opened a garage at 127 Sherman street, Hutchinson, Kans. He handles Buick cars.

Parker & Hudson is the style of a new firm which has "opened up" in Philadelphia, Pa. Commer and Sandusky trucks will be handled.

Rolick Brothers have broken ground for a mission-style garage in South Main street, Porterville, Cal. It will be styled Auto Hospital.

Philip B. Arnold has purchased the property at the corner of Jay and Fifth streets, Colusa, Cal., and will erect thereon a fireproof garage.

H. S. Lee and L. Arris have leased the Pacific Garage, on Front street, Turlock, Cal. They will continue the business under the same style.

Stahl & Stone, who operated a garage at 928 Kansas avenue, Topeka, Kans., have found their quarters too small and moved to 621 Quincy street.

Ground has been broken for a \$20,000 fireproof garage on South Nevada avenue, Colorado Springs, Col. It will be occupied by the C. W. Blake Auto Co.

Green & Ostrand, who operate a garage at Cobleskill, N. Y., have sold a third of their interest to William Letts, who brings with him the agency for Ford cars.

William Dominick & Co., have opened salesrooms in Chicago, in which to display the Bowling Green delivery wagon, for which they have the Chicago agency.

A. J. Clipper & Sons, owners of the Turlock Garage, in the California city of that name, have disposed of their business to the Johnson-Marston Mercantile Co.

An electric garage has been opened at the corner of Fir and Fifth streets, San Diego, Cal. It is in charge of Mark Roberts and houses the Detroit Electric agency.

Ground has been broken for a garage on the lot adjoining the Hotel Sutter, Yuba City, Cal. It will be styled the Sutter Garage and be managed by Frank McAvoy.

Theodore W. Sanford has opened a salesroom in Ansonia, Conn. He will handle White pleasure cars.

Another garage has been opened in Miami, Fla. It will be known as the American Garage & Machine Co., and be under the management of G. R. Oldendorf and P. M. Mortem.

S. J. Wise & Co., of New York, who are Eastern distributors for Amplex cars, have opened a branch in Boston, Mass. It is located at the corner of Boyleston and Fairfield streets.

The Purdue Automobile & Taxicab Co., has been organized in Salt Lake City, Utah, to take over the business of the Taxicab Service Co., the capital of the new concern is \$50,000.

The Crow Automobile Co., of Portland, Ore., is building new salesrooms to house its greatly enlarged business. The company handles Stutz, Rambler and Krit pleasure cars, and Mais trucks.

The Motor Car Service Corporation has been formed at Los Angeles, Cal., to operate a garage and service station at 812 South Spring street. W. M. Bailey is the owner and Billy Macnider the manager.

In order to obtain more room the H. W. Johns-Manville Co. has removed its Louisville (Ky.) branch from the Lincoln Savings Bank Building to 205 Paul Jones Building. The branch is in charge of J. R. Chowning.

Humphrey & Tabor have opened a salesroom and garage at 308 North Main street, Waterbury, Conn., under the style Reo Automobile Co., of Waterbury. As the name implies, they will deal in Reo cars exclusively.

Aldora Shem has purchased the interest of William T. King in the Standard Auto Garage of Alliance, Ohio; Akins, the senior partner retaining his share. The new firm of Akins & Shem will continue the business under the same style.

Jockers & Stack, proprietors of the Queensboro Garage, at Flushing, L. I., have leased the Sanford Avenue Garage in the same town and will operate it as an annex to their main business. They are located at 66 Broadway.

J. L. Colburn and William Moore have purchased the Oneonta Auto Co., in the New York town of that name, from the former owner, Frank B. Booke, of Otego, and have taken immediate possession. They will handle Cutting and Buick cars.

The Lexington Co., of New England, which recently was organized in Boston, Mass., to handle Lexington cars, has op-

ened salesrooms at the corner of Boylston and St. Cecilia streets. A. F. Baker is general manager of the company.

The Barber Motor Sales Co. has been formed in Detroit, Mich., for the purpose of distributing the Detroit. Zach G. Barber is the general manager of the company, which is building a salesroom and garage at Woodward avenue, near Willis avenue.

The Eureka Automobile Co., which recently was formed in Scranton, Pa., by merging the Court House Square Garage with the old Eureka Garage, has decided to continue business in both places. D. W. Sweet has been appointed general manager of the company, which handles E-M-F, Speedwell and Flanders cars.

George L. Long, who for ten years has been operating a garage in Warsaw, N. Y., under the style the Warsaw Automobile Garage, has found his old quarters too small and is building a two-story fireproof garage, 52 x 116 feet, on Main street. He has the agency for the Oakland, Marathon, Apperson, Everitt and Warren lines of cars.

The Early Motor Car Co., of Columbus, Ohio, has filed a petition in involuntary bankruptcy and Charles F. Brandt has been appointed receiver. The assets are placed at \$31,192.78, while the liabilities exceed \$67,000. Chief creditor of the company is the president and general manager, Dr. L. M. Early, who advanced \$57,284 on promissory notes.

Recent Losses By Fire.

Jamestown, N. Y.—Patterson Co.'s garage at Mayville burned. Loss, \$2,500.

Bloomsburg, Pa.—Samuel Harmon's garage and contents destroyed. Loss, \$5,000.

Stevenson, Md.—Walter B. Brooks's garage burned, contents saved. Loss, \$2,000.

Detroit, Mich.—Reynolds Auto Co., garage and contents damaged by fire. Loss, \$6,000.

Paterson, N. J.—Auto Shop Co.'s garage, 10 Crosby place, and 12 cars destroyed. Loss, \$40,000.

Pittsburgh, Pa.—Isaac Guckenheimer's garage, 5605 Irvin avenue, and contents destroyed. Loss, \$10,000.

Little Falls, Minn.—Farrow Automobile Livery with six automobiles burned. Loss, \$12,000; caused by explosion of tank.

Buffalo, N. J.—Buffalo Motor Vehicle Service Co.'s garage, at 178 West Utica street, damaged by fire. Loss, \$3,500.

Cincinnati, Ohio.—Henry Freiberg's garage, 358 Forest avenue, and James S. Atkin's garage, 4015 Rose Hill avenue, damaged by fire.



Sibley, Mich.—Church-Field Motor Co., under Michigan laws, with \$150,000 capital; to manufacture automobiles.

Philadelphia, Pa.—Automatic Wagon and Truck Co., under Pennsylvania laws, with \$100,000 capital; to manufacture motor vehicles.

Bozeman, Mont.—Story Motor Supply Co., under Montana laws, with \$100,000 capital. Corporators—Nelson Story, Jr., H. L. Casey, S. S. Crockett.

Hagerstown, Md.—Hagerstown Garage Co., under Maryland laws, with \$10,000 capital; to do a general garage business. Corporators—Albert C. Nigh, Elmer G. Detrich, Edgar F. Rohrer.

Chicago, Ill.—Auto Supply Manufacturing Co., under Illinois laws, with \$50,000 capital; to manufacture automobile supplies. Corporators—Carl Youngsberg, Oscar Albertson, Axel W. Olsen.

Cleveland, Ohio—Acme Auto Co., under Ohio laws, with \$10,000 capital; to deal in automobiles. Corporators—Willis C. Polack, John D. Meyer, Mary E. Pollack, Susie K. Meyer, Elmer Edgerton.

Austin, Tex.—Capital City Auto Co., under Texas laws, with \$35,000 capital; to deal in automobiles. Corporators—Pierre Bremond, W. M. Graham, Howell J. Grinnan, R. M. Thompson, Jr.

Camden, N. J.—Rowe Motor Manufacturing Co., under New Jersey laws, with \$500,000 capital; to manufacture automobiles. Corporators—Chas. D. Besore, Mauch Lambert, Florence M. Giskill.

Newburgh, N. Y.—Sunderman Safety Carburette Co., under Illinois laws, with \$50,000 capital; to manufacture and deal in patented articles. Corporators—J. D. Lacey, F. R. Sunderman, W. L. Walker.

Boonton, N. J.—Boonton Transportation and Garage Co., under New Jersey laws, with \$125,000 capital; to do a general garage business. Corporators—Frank E. Morse, Lawrence B. Morse, Raymond Dawson.

Toledo, Ohio—Auto Specialty Co., under Ohio laws, with \$10,000 capital; to deal in automobile specialties. Corporators—Chas. S. Northup, Lewis W. Morgan, Louise Letcher, Earle Peters, Chas. H. Masters.

Cleveland, Ohio—The E. A. Hammer Co., under Ohio laws, with \$15,000 capital; to deal in automobile and motor boat accessories. Corporators—J. Bushea, J. Miller, C. Murman, W. J. Mahon, E. A. Hammer.

Cleveland, Ohio—Crawford-Hough Garage Co., under Ohio laws, with \$10,000 capital; to deal in automobiles. Corporators—Richard H. Lee, G. R. Collar, G. M. Gallagher, George E. Bradbury, Henry R. Call.

Troy, Ohio—Troy Rubber Tire Co., under

Ohio laws, with \$10,000 capital; to manufacture automatic tires. Corporators—Jacob Sweigart, Sherman LeBlond, Cyrus S. Petrie, Charles S. Drake, Alvie V. Kiser.

Anderson, Ind.—Simplex Manufacturing Co., under Indiana laws, with \$50,000 capital; to manufacture engine starters. Corporators—W. S. Poling, G. J. Derthick, J. F. Stanley, W. R. Poland and May A. Osborne.

Toledo, Ohio—Indiana Invincible Starter Co., under Ohio laws, with \$1,000 capital; to manufacture engine starters. Corporators—Leon Z. Netzorg, Anna B. Netzorg, Rebecca Friedman, Albert Miller, K. I. Morgan.

Peoria, Ill.—Palm Gum Tire Seal Co., under Illinois laws, with a capital of \$1,500; to manufacture a composition for automobile tires. Corporators—William Swords, Jr., Harry D. Du Chesne, William Turnbull.

Hartford, Conn.—Connecticut Commercial Car Co., under Connecticut laws, with \$25,000 capital; to deal in automobiles and manufacture sundries. Corporators—Joseph J. Rapter, Gustave F. Kaliberg, James B. Henry.

Hammondsport, N. Y.—The Curtiss Motor Co., under New York laws, with a capital of \$600,000; to manufacture motors and vehicles. Corporators—M. Wheeler, Bath; J. S. Fanciully, G. R. Hall, Hammondsport.

Atlanta, Ga.—Atlanta Automobile Accessories Association, under Georgia laws, with \$5,000 capital; to manage the Atlanta Automobile Show. Corporators—G. W. Hanson, John E. Smith, Frank J. Long, Lamar Hill.

Grand Rapids, Mich.—Panwood Manufacturing Co., under Michigan laws, with \$60,000 capital; to manufacture and deal in automobile accessories. Corporators—Fred Z. Pantlind, Harold B. Woodcock, Robert G. Woodcock.

Cincinnati, Ohio—The F. B. Williams Co., under Ohio laws, with \$10,000 capital; to deal in and rent automobiles. Corporators—Fanny B. Williams, George C. Kuhn, Dwight F. Jerauld, Samuel Mummel, David S. Buchanan.

Atlanta, Ga.—Automobile Club of Georgia, under Georgia laws, without capital; to promote good-fellowship among automobilists. Corporators—George W. Hanson, Edward M. Durant, J. D. Rhodes and Howard Geldert.

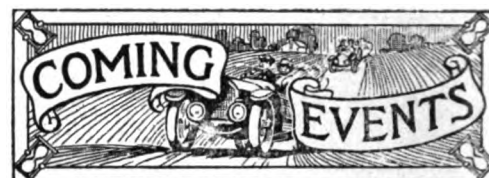
Increases of Capital.

Detroit, Mich.—Krit Motor Car Co., from \$250,00 to \$500,000.

Portland, Ind.—Portland Body Works, from \$24,000 to \$54,000.

Victoria, Tex.—Texas Motor & Supply Co., from \$3,000 to \$15,000.

Saginaw, Mich.—Argo Electric Vehicle Co., from \$200,000 to \$400,000.



January 27-February 3, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Pleasure vehicles only.

January 27-February 3, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of pleasure cars.

January 29-February 3, Scranton, Pa.—Second annual automobile show in 13th Regiment Armory.

February 1-7, Washington, D. C.—Annual show in Convention Hall.

February 3-10, Montreal, Can.—Automobile Club of Canada's annual show at Drill Hall.

February 3-10, Harrisburg, Pa.—Harrisburg Automobile Dealers' Association's third annual show in Harrisburg Arena.

February 5-10, Pittsburgh, Pa.—Automobile Dealers' Association of Pittsburgh, Inc., sixth annual show of commercial vehicles.

February 5-10, Chicago, Ill.—National Association of Automobile Manufacturers' 11th annual national show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

February 5-17, St. Louis, Mo.—Annual show in the Coliseum.

February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

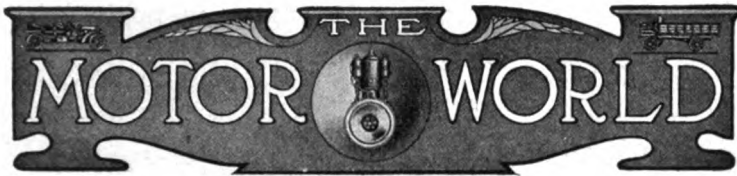
February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.

February 17-24, Pittsburgh, Pa.—Pittsburgh Automobile Show Association's annual show in the Exposition Building.

February 19-24, Hartford, Conn.—Hartford Automobile Dealers' Association's show in the State Armory.

February, 20-24, Binghamton, N. Y.—Annual show in the State Armory.

February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.



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NEW YORK, FEBRUARY 1, 1912

THE A. A. A. AND ITS CONTROL OF SPORT.

In line with his action of twelve months ago in announcing the withdrawal of his big company from further participation in speed events, Mr. Benjamin Briscoe, president of the United States Motor Co., has addressed a communication to the American Automobile Association urging that organization to abandon its control of racing and to devote itself to the promotion and encouragement of touring and reliability contests and the furtherment of good roads work. While his opinions are known to be pronounced, and his communication expresses sincere convictions, it may be questioned if the automobile interests would be well served did the A. A. A. heed Mr. Briscoe's urging.

There can be no doubt that trade interest and public interest in racing has lessened and is lessening, but so long as men engage in promoting and in the participation of speed contests there will be need for a strong directing hand at the helm—a hand that is not merely strong itself but that is made stronger by those alliances with other sports' governing organizations which make such government far-reaching and complete. The A. A. A. alone possesses this strength. It was acquired as the result of many years of effort and negotiation. To take such a hand from the helm would practically require that a new beginning be made. If the hand were removed, it would mean also that automobile racing would degenerate into "wildcat" sport—that it would become noisome, if not wholly repulsive, and anything of the sort could not but unfavorably affect the automobile interests generally.

From any point of view such a situation would be undesirable, and as the A. A. A.'s abandonment of its control would invite

such conditions, it does not seem proper that the invitation should be extended. As the Motor World repeatedly has stated, the A. A. A. will do well to devote more of its time to the encouragement of real amateurism and to those non-speed forms of competition in which amateurs and private owners are likely to engage, but while it retains control of sport it would be deplorable did it surrender any part of it.

THE DISAPPEARANCE OF THE "FREAKS."

One of the surest signs of the sanity and stability of the automobile industry and of the ripened experience of the individuals and firms that constitute it, was the absence from the national shows of the current year of what commonly are called "freaks"—cars which, built solely for the purpose of materializing inexperienced inventors' dreams, always were looked for and usually appeared at the shows of past years. As a matter of fact, the crop of freaks has been dwindling for several years, but though the end has been in sight this is the first series of shows that has passed into history without bringing out a single mechanical monstrosity.

Every industry passes through an epoch that is marked by the frequent appearance—and, fortunately, by the equally frequent disappearance—of more or less fantastic ideas that may or may not have some merit other than mere novelty, but which are put into concrete form without regard for their relation to their surroundings and usually without regard for engineering limitations. But progress and experience invariably eliminate these incongruities; their first appearance usually is their last.

The elimination of "freaks" from the more important automobile shows—finally, it is to be hoped—reasonably may be taken to indicate that the automobile industry has reached a point where it is on a sound, sensible engineering basis, with standards that are the outcome of experience and with an appreciation of the seriousness of its work that leaves no room for mechanical buffoonery.

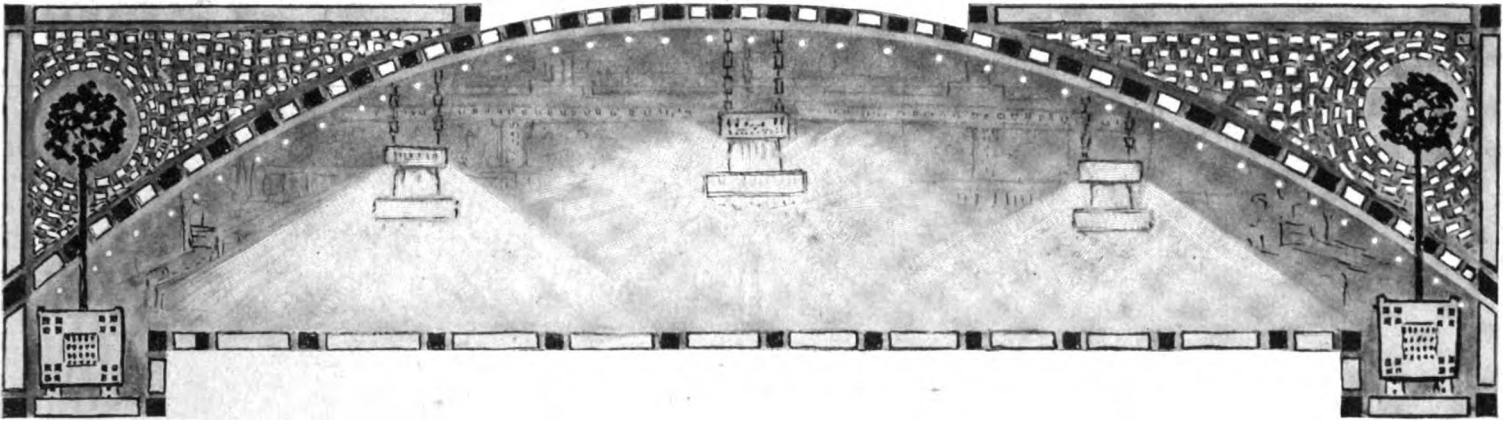
After many years, an Attorney-General of New York State has formally decided that "it is clear" that the registration fee imposed on automobiles "is a tax and there can be no doubt it is imposed on the use of property." Not a few of his predecessors in authority were put to great pains to deny the obvious fact and performed some tall mental wriggling in the attempt to explain when and why the fee is not a tax. Attorney-General Carmody's decision serves to verify the oft-expressed opinion that taxing one class of citizen for the right to use his private property on the public road and exempting all other classes smacks mightily of class legislation. If Mr. Carmody now will explain why such taxation is not class legislation he will add to the sum total of human intelligence.

Despite the cold water poured on it when the project was mooted last year, and although conditions have changed not at all, those Chicago enthusiasts who were bent on conducting a truck contest from Chicago to New York have again returned to the attack. As the roads have not been improved, nor the bridges strengthened, and as motor trucks are not designed for cross-country usage, "circus stunts," or for long hauls, the cost of which cannot but be contrasted disadvantageously with the cost of railroad hauls, it would seem that no more reason exists for such a contest than existed a year ago and that at this time it will not serve more good purposes.



GENERAL VIEW OF DECORATIONS AND EXHIBITS IN THE CHICAGO COLISEUM

D 28



CHICAGO SHOW A BEWILDERING SPECTACLE

**Mosaic Decorative Scheme That Suggests Alice's Wonderland and Defies Description and Eclipses the Exhibits—Several New "Sixes" and Compartment Roadsters Make Their Appearance—
Otherwise the Show is Substantially a Duplication of the New York Exhibitions.**

Perhaps it's just as well that no advance information regarding the decorative scheme adopted for the Chicago show was given out. It is doubtful if it could have conveyed any true idea of what it is like.

Even now, after the show has been in progress for several days and has been witnessed by thousands of people it is doubtful whether anyone has found or can find words adequate to describe it. It defies description. That's a badly overworked term; but take it from one who has seen all of the long line of automobile shows held in both New York and Chicago, there never was a show dressed like this one. Neither Solomon in all his glory, nor the Queen of Sheba and all her fancy raiment and trappings had anything on the Chicago show of 1912.

All of the Chicago writers who faced the problem, took a hop, skip or a jump over the decorative scheme; none could find words that even begin to convey an idea of its spectacularity. When the Motor World man appealed to Manager Miles, who accepted the decorations in the name of the National Association of Automobile Manufacturers, Miles, he lay back and laughed merrily.

"Why, I tried for two months to write a description of those decorations but I couldn't do it," he good-naturedly confessed. "I tried to get the decorator to describe them, but did not succeed. What is the underlying idea? Well, you might call it a mosaic palace; that was the general effect aimed at. What are those superstructures? I don't know what you can call them, I don't believe they have any name. No, they are not modified Japanese pagodas; I don't believe they represent anything in particular. They are just de-

corations. Nothing but a photograph can give any idea what they're like," and Miles again laughed merrily as if he enjoyed the discomfiture of those who were at a loss to find words to do the subject justice.

If Manager Miles, plus the decorative artist, was not equal to the task, there is excuse for all.

Photographs may give a general idea of the character of the decorations. But they can convey not even a suggestion of the wealth, the riot of color, nor the near-fairyland into which they convert the Coliseum when the lights are aglow. The suggestion of a mosaic palace is plainly to be seen once it is pointed out, but with the other and indescribable panoplies it is a mosaic palace such as only Alice might have found in Wonderland.

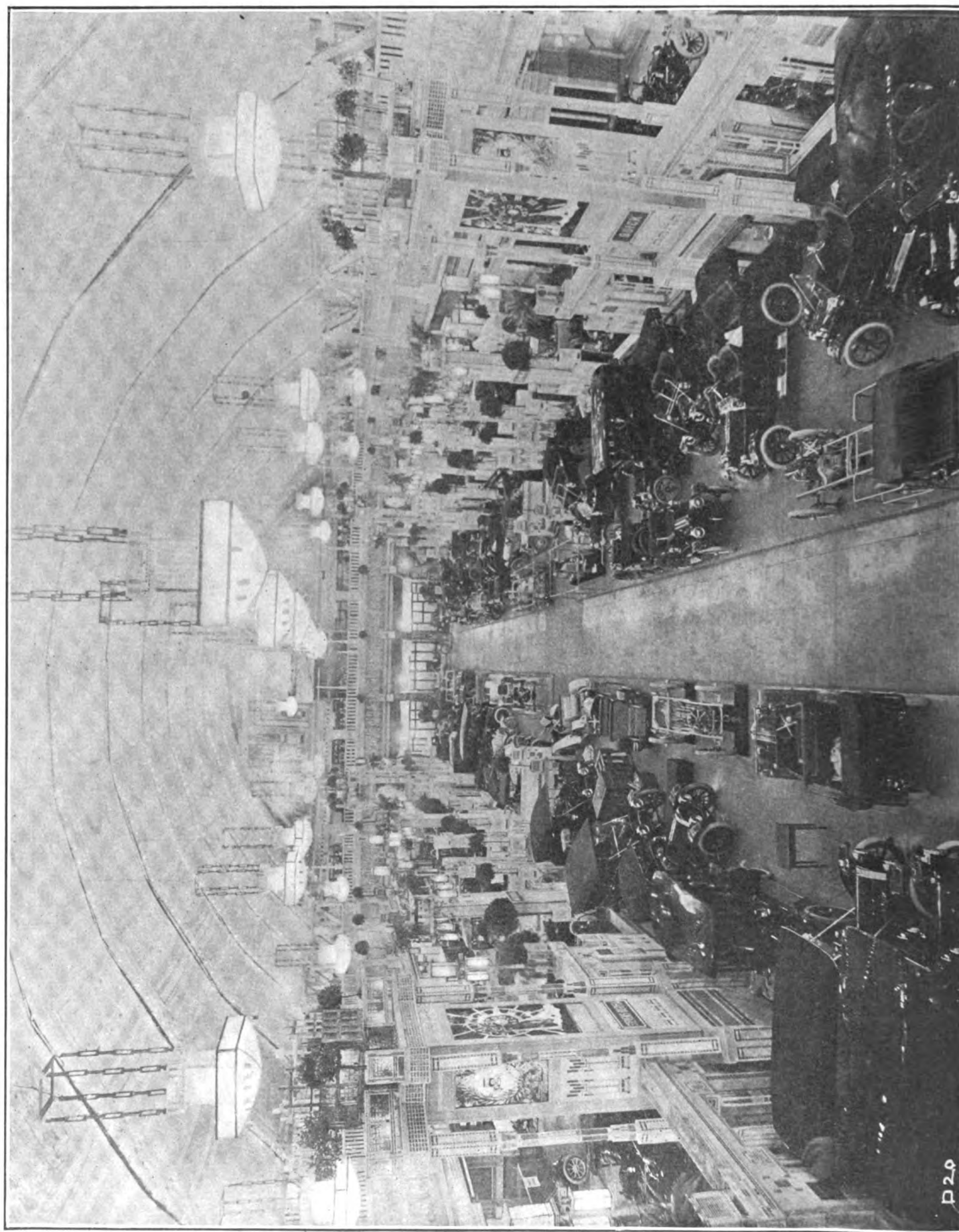
Of late years the Chicago show has become more than an exhibition of automobiles; it has become a spectacle, and as Western folk apparently like that sort of thing, Manager Miles has risen to the occasion each successive year and dispensing with the song and vaudeville with which he once regaled the show-goers he has made each successive show more spectacular than the ones that went before. The present show is the most spectacular of all. The trappings are so ornate that they throw the cars into an eclipse.

The mosaic roof is truly a thing of beauty. In the great painted arch the semblance to mosaic work is so well carried out as to challenge easy detection. The center of the arch is a succession of circular panels in which red flowers are laid, each row of tiling as the arch bends to meet the side walls, being of different hue and design—light greens and pinks, and blues, and browns, relieved near the lower

row of a simulation of potted plants, also done in tile work, always remembering that the "tiling" is a work of the brush and not of stone. From this great semi-circular dome there are pendant by chains three rows of lanterns of squared design and of heroic size, and of a soft rose hue that lends a warm glow to the whole fairy-like scene.

The balcony, on which the accessory exhibits are displayed, has a white wood rail below which, extending the full length of both sides of the great hall, are panels depicting a somewhat impressionistic forest scene into which the semblance to mosaic design also is conveyed. Covering the walls at both ends of the hall are huge drop curtains on which the forest scene is portrayed in even more striking proportions.

If "up aloft" the decorations are well nigh impossible of description those that are upreared on the main floor are almost beyond the power of words. A wide main aisle divides the exhibits into halves, each half in turn being bisected by superstructures for which even the decorators have not found a descriptive. For want of better terms, the central portions of these superstructures may be referred to as clock-towers, surmounted by toy roof gardens. At any rate the four central pieces bear on either side a clock dial done in deep red and across the face of which is a "roof garden," or at any rate a structure with four projecting overhangs on which potted plants are placed and which, lighted from within, contribute the effect of green mosaic transparencies. Abutting the clock towers and extending in either direction is a structure on either end of which is upreared what, for want of a better word, may be described as a turret or what-not, a design to be found only in wonderland. They, too, are topped



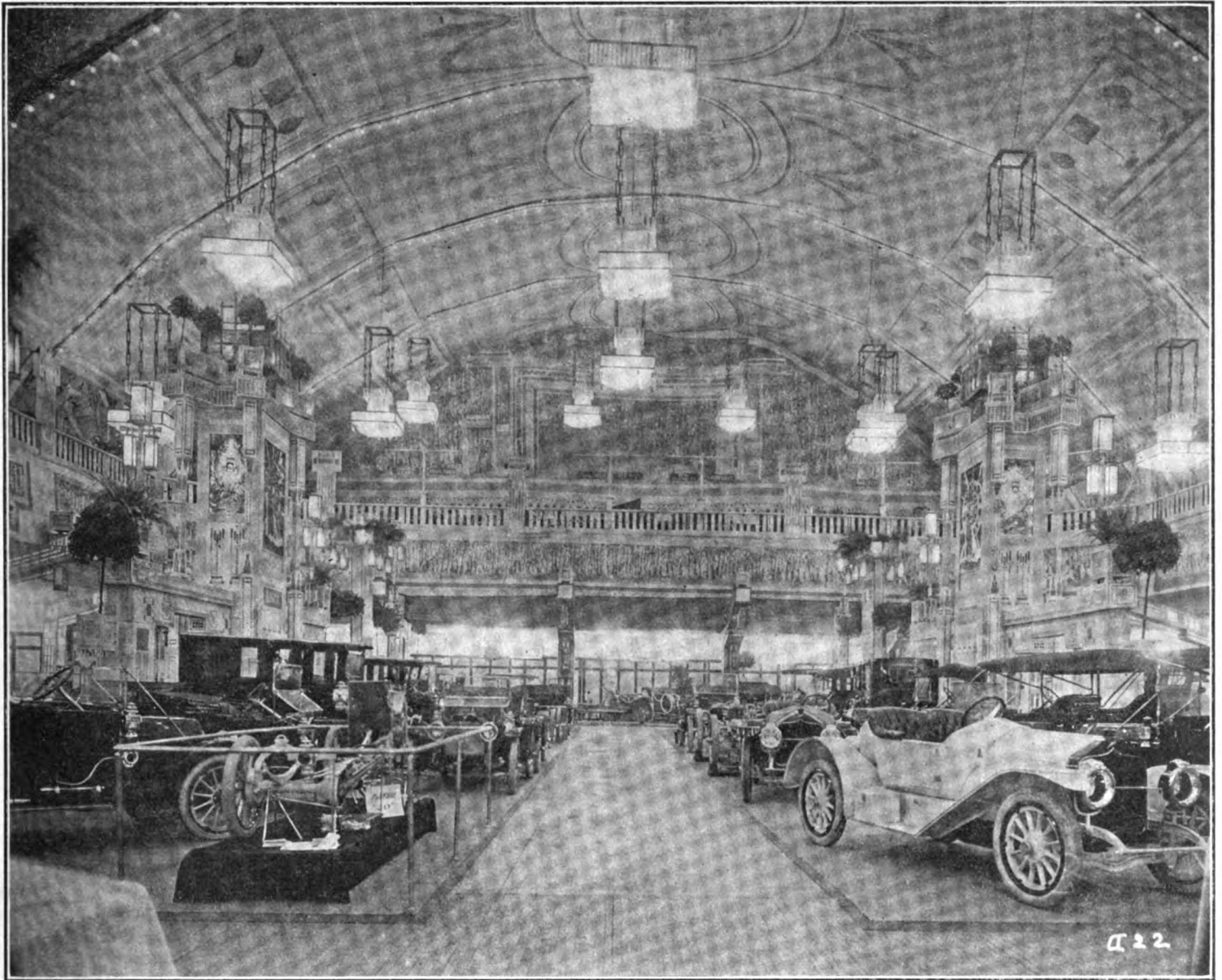
LOOKING AT THE DECORATIONS AND EXHIBITS FROM ANOTHER POINT OF VIEW

P 20

or flanked by soft green lanterns, and when the lights are turned on, the soft reds of the overhead lanterns, the greens of the "roof gardens" and the "turrets" and the deep reds of the illuminated clock dials form a spectacle that is not short of fairy-like. The clock towers and the "turrets" and the other superstructures are done in white mosaic with interlaid checkered pat-

tern from which the armory is separated by an uninviting alley. The decorations in the armory are as simple as those in the Coliseum are bewildering. The glass skylight is hidden by a painting which suggests a glass roof on which autumn leaves have fallen in abundance, and through which a painted azure sky can be seen. The railing of the gallery which holds the overflow

Unlike the New York shows, the Chicago exhibitions do not wait for nightfall to be inaugurated. The doors are opened at 2 o'clock P. M., but just the same the crowd does not flock until the street lights are turned on. On Saturday last, 27th ult., the snow was gently falling shortly before the opening hour, but at 2 o'clock the dismal weather prospects had given way to bright



HUGE DROP CURTAIN DEPICTING A FOREST SCENE THAT PICTURESQUELY CONCEALS THE NAKEDNESS OF THE WALLS

terns of green and gold to afford relief. The same white and green, and gold effect is carried under the overhanging balcony, under which cars also are displayed.

The spectacle is confined almost wholly to the Coliseum. In the Coliseum Annex, the small hall which directly adjoins the main building, there is merely a rough suggestion of mosaic work. It is by no means in keeping with the decorative scheme of the Coliseum proper and conveys no idea of palaces, mosaic or otherwise.

In the First Regiment Armory, where the "overflow" always is staged, there is not even a rough suggestion of the fairy-

of accessory exhibits is draped simply with green and white bunting, while the floor decorations are reminiscent of last year's spectacle in the Coliseum, from which, indeed, they were borrowed. The great waves and monuments of tinted staff work which then were used are not in the armory, but here and there are those huge Louis XV vases and those heroic seashells, tinted in blues and pinks, and greens, and golds, in which there are palms and potted plants. No effort has been made to form a picture or to follow a fixed theme of decoration. The nakedness of the armory is relieved and nothing more.

sunshine and the doors swung open auspiciously within and without, although, truth to tell, there were a number of exhibits, both of cars and of accessories, that were not in place; the vacant spaces were not filled until Monday. But if the great crowd that flocked at 8 o'clock and thereafter, noticed the blanks it was not particularly observable. The decorations so completely filled the eye, that a few omissions counted for naught.

As always has been the case, the Chicago show naturally is largely a doubling up and duplication of the two New York functions that went before it, and which

served to introduce to New Yorkers, and those who foregathered in the Eastern metropolis, the latest handiwork of many of the manufacturers. To those who saw the others, therefore, it is an old story. That is, it is almost but not quite, an old story. For though many of the exhibits have been transplanted bodily and except for a slight rearrangement of cars and chassis are exactly as they were in New York—in not a few cases even the arrangement is the same—several of them are more complete for the addition of another model which was crowded out of the Garden or the Palace, or which was not quite ready to bear the "fixed glance" of the curious at the time the New York shows were opened.

As complete as were the Eastern shows, however, the Chicago show is even more complete, for in addition to holding the products of all the car manufacturers who occupied spaces in New York, with but very few exceptions, it also contains an

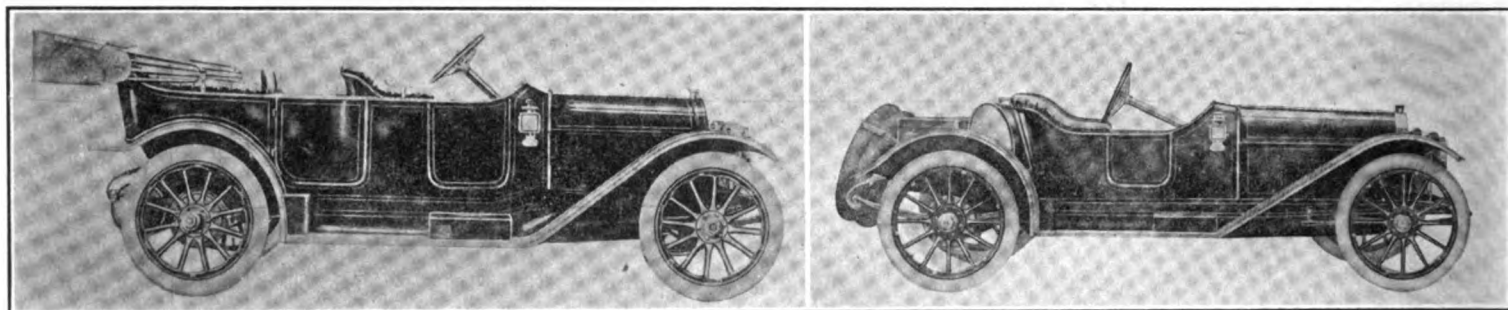
salesman who answers questions about it can be accepted as an indication. It is styled a "Speedway Roadster" by the manufacturer and resembles not a little Ray Harroun's famous "Wasp" which is staged beside it. Of course it hasn't got the "Wasp's" long tail, nor its fantastic body, for it is designed to be a gentleman's roadster. As such it has a modified racing body—modified so as to increase the comfort of passengers—tastefully finished in dark green with a big gasoline tank back of the seats. The reason for the appellation "Speedway Roadster," it is explained by the patient salesman, is because it has been "specially tuned for speed," and if the records which Marmon cars have made on road and track may be taken as a criterion there are few who will pass its proud possessor on the road. In common with the other Marmons, it is equipped with a Prest-O-Starter and two-point ignition.

Another of the "transplanted" exhibits which has been filled out by the addition of

Cartercar chassis, sole exponent of friction driving, as it was in Madison Square Garden in New York, ran day and night for the edification and education of a throng of interested spectators. Stoddard-Dayton, Buick and Maxwell chassis with their vitals exposed, and others which became familiar to New Yorkers, and which now are as familiar to Chicogans. Incidentally, the Flanders halved chassis continued to draw the crowds and elicit the expressions of wonderment that it did at the earlier exhibitions.

As attractive as are the Coliseum and Armory exhibits, either collectively or individually, however, the Coliseum Annex exhibit is even more attractive, at least to those who have seen the New York shows, for it houses no less than eight of the dozen makes of gasoline propelled cars that were reserved for unveiling at the Western show.

Perhaps the best known of the eight, and a brand which in several successive Chicago exhibitions has shown consistent



NEW SIX-CYLINDER 50-HORSEPOWER HALLADAY

THE NEW "30" IN ROADSTER FORM

even dozen brands of gasoline cars whose manufacturers seldom, if ever, exhibit elsewhere than in Chicago, not to mention four makes of electrics that were missing from the other shows. Not to mention electrics in Chicago, it might be added, would be a grave oversight, for as probably everyone knows, the Windy City counts as one of its distinguishing marks the fact that a greater number of electrics are owned and operated than in any other large city of the United States. It was to be expected, therefore that electrics would be out in greater force than they were in New York; and no less than 11 brands, all told, are on view.

Prominent among the "transplanted" exhibits of gasoline cars which have been made more complete, and if possible more attractive, by the addition of a model not previously revealed to the show-going public is the Marmon display. It goes without saying that the "Torpedo Limousine" which attracted so much attention at Madison Square Garden, and which would attract attention anywhere by reason of its inherent beauty of line and finish, comes in for the same amount of attention in the Coliseum. Be that as it may, however, there is a nifty-looking roadster that beats it hands down in the estimation of show-goers, if the throngs which daily and nightly gather around it, and the word of the weary

a model not previously shown is the American, and in this case, too, the addition is a roadster. It is a smaller, in fact, the smallest edition of the well-known American underslung line, and is rated at 22-horsepower; its official title is the American "Scout." The body is enclosed and is painted white with a relieving fine black stripe around the top of the sides and around the doors. The running gear and engine hood are black, and the whole is set off by the dark green upholstery and nickel trimming.

One of the things to impress those who have seen all three shows is the comparative scarcity of "moving" exhibits. Among the accessory and parts maker's exhibits there are plenty of "buzzers" and sparkers and other attention-attractors, for it is easy to make such things demonstrate themselves. But among the car exhibits movement of any kind is a great deal scarcer, in proportion to the number of exhibits, than it was at the New York shows. At the Reo exhibit, a "Reo the Fifth" chassis runs more than a few miles a day with the aid of an electric motor and always gathers a crowd. Not far removed, a Cadillac chassis, like the Reo transplanted from Madison Square Garden, raised on "stilts," runs under its own power, so to speak, the power being furnished by its own engine-starting system. Over in the Armory exhibition a

improvement until at present it ranks well up the ladder, is the Halladay. The purpose of the Streater Motor Car Co., which manufactures the Halladay cars, to put into its products 100 cents worth of value for every dollar of price is amply reflected in the stripped chassis and the two touring car models which are exhibited. By way of still greater emphasis it is merely necessary to add that though the 30-horsepower model which last year represented unusual value at \$1,300 has been practically redesigned and made more up-to-date and efficient in every respect, \$200 has been lopped off its price. In fact, it has been more than redesigned; it is a new car all the way through for its three essential elements, motor, change-gear mechanism and rear axle are entirely new. To those who are familiar with the well-known Rutenber motors it will not be necessary to point out that there are few if any that are more honestly built, and that have a higher reputation for all around reliability and efficiency. It is sufficient recommendation, therefore, to state that the motor used in this particular car, and in fact in all the other Halladay cars, bears the Rutenber name plate. What is more, it is one of the latest products of the Rutenber plant, and is of the true long-stroke type; the cylinders measure $3\frac{3}{4}$ inches bore, and $5\frac{1}{4}$ inches stroke.

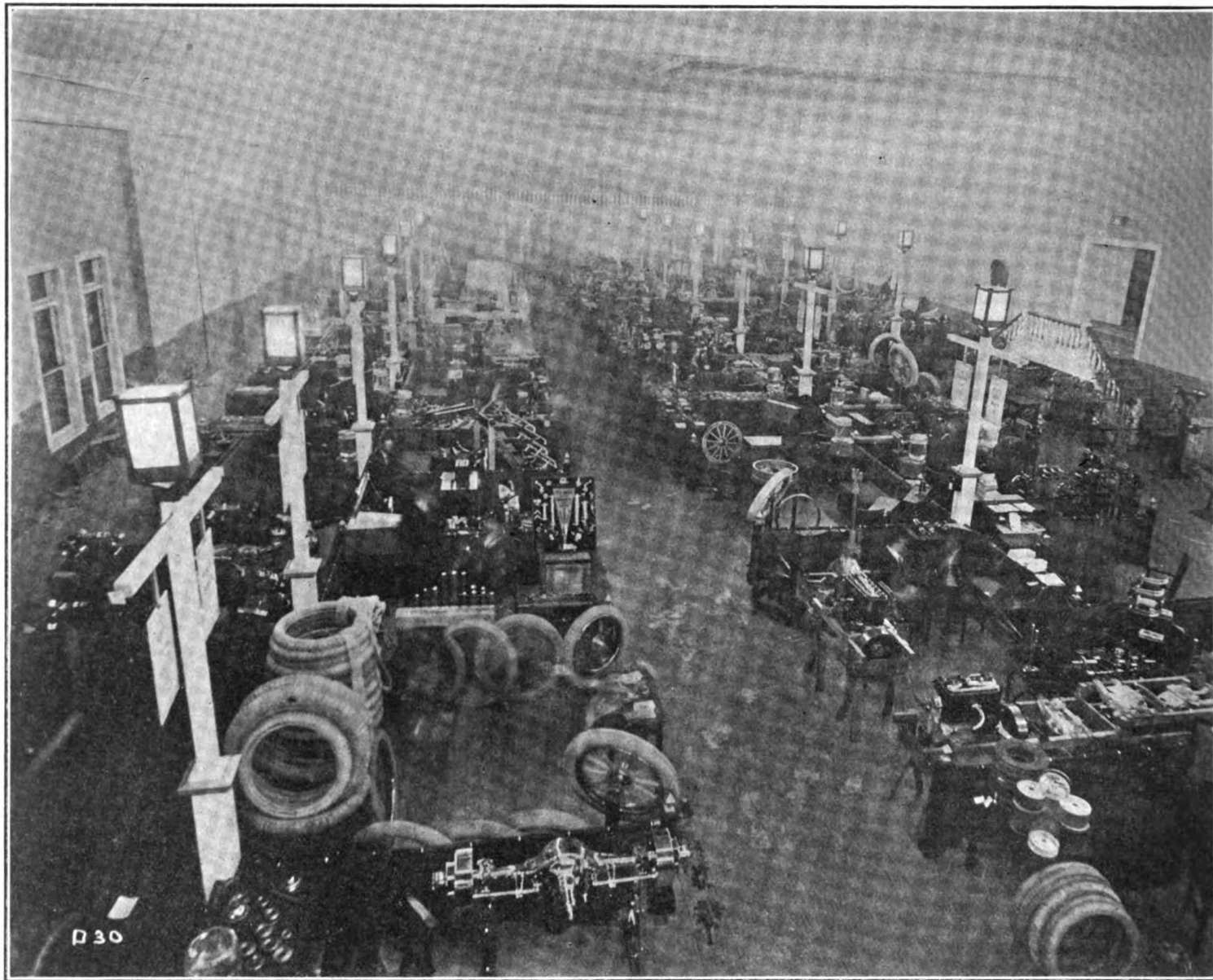


CLOSE-RANGE VIEW OF THE MOSAIC "CLOCK TOWERS," "ROOF GARDENS" AND "TURRETS"

By way of obtaining a more equal distribution of weight and also to facilitate inspection purposes, the change gear mechanism now is supported at three points in the waist of the chassis instead on the rear axle. It is selectively operated and provides three speeds forward and reverse. Obviously the relocation of the gear set changes slightly the construction of the rear axle and though it still is of the se-

was the new model and to which particular attention was directed for this reason is just the same as it was when it first was brought out, except, of course that several slight refinements have been made in its mechanical construction, and the several types of body which are mounted on the chassis have been materially improved with a view to providing even greater comfort for passengers. Like the smaller model it

be discontinued. As has been previously intimated, a Rutenber unit power plant is used, the bore and stroke being $4\frac{1}{8} \times 5\frac{1}{4}$ inches. A cone clutch is used in place of the multiple disk clutch which last year was used on the "4-50." Similarly, the flexibility of the car has been made more perfect by the substitution of a four-speed selectively operated change-gear mechanism of approved design.



GENERAL VIEW OF THE ACCESSORY EXHIBITS IN THE COLISEUM ANNEX

mi-floating variety, refinements including the use of a more efficient type of roller bearings throughout and a general strengthening have been made. The rear springs also have been altered slightly, the easy riding qualities of the car having been increased by the substitution of long three-quarter elliptic members for the full-elliptic springs that were used in the past. The wheelbase is 112 inches, and the touring cars are carried on $32 \times 3\frac{1}{2}$ inch tires; tire equipment on the roadsters is $34 \times 3\frac{1}{2}$ inches all around.

The 40-horsepower model which last year

employs a Rutenber motor the cylinder dimensions being $4\frac{1}{2}$ inches and 5 inches bore and stroke. Multiple disk clutch, three-speed selectively operated change-gear mechanism and full floating rear axles are its other cardinal features.

Though these two chassis, mounted as they are with a wide variety of bodies form a really extensive line which permits considerable latitude for choice, the line this year has been still further increased by the addition of a brand new six-cylinder model. It is designed to take the place of the four-cylinder 50-horsepower model which will

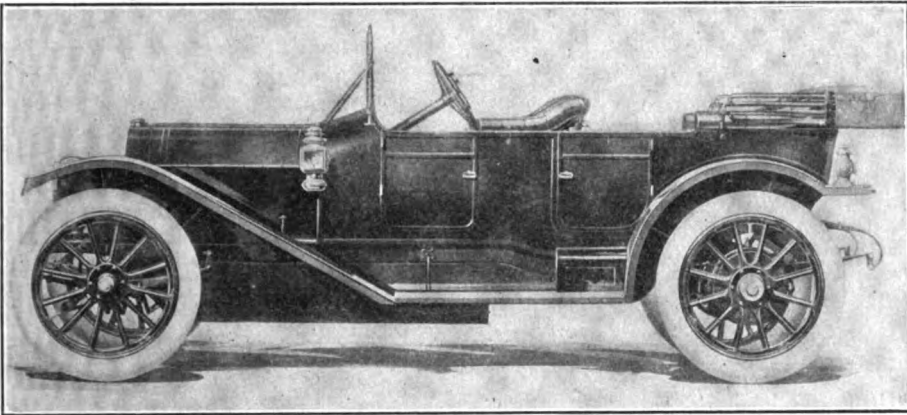
The other features such as three-quarter elliptic rear springs and full-floating rear axle are common with those on the 40-horsepower model. In either small tonneau or touring form, the new "six" has a wheelbase of 134 inches; with a roadster body the wheelbase is four inches less. The tires in any case are $36 \times 4\frac{1}{4}$ all around, mounted on either quick detachable or demountable rims. Including such items of equipment as top, windshield, speedometer, engine-starter, electrical equipment, Prest-O-Lite tank and the usual complement of lamps, tools and spare parts, the price is

\$3,000 for either of the several body styles which are listed.

Another line which during the past few years has shown steady improvement is the Kissel. By way of calling attention to a beautifully finished six-cylinder seven-passenger model, it is exhibited on "stilts" at a level a foot or so higher than the other cars in the space, of which there are no less than four different types, and forms an effective background. It is a flush-sided creation in which the hood and dash and

ical to operate. Cardinal features which are common to both the 30 and 40-horsepower models are the distinctive Kissel cone clutch in which the male member is of aluminum, and is equipped with a number of small spiral springs arranged in pockets which serve to hold the leather facing away from the base and therefore make for smoothness of operation, three speed selectively operated change-gear mechanism and full-floating rear axles. The "Six-Sixty" is a big car, roomy and handsome, and

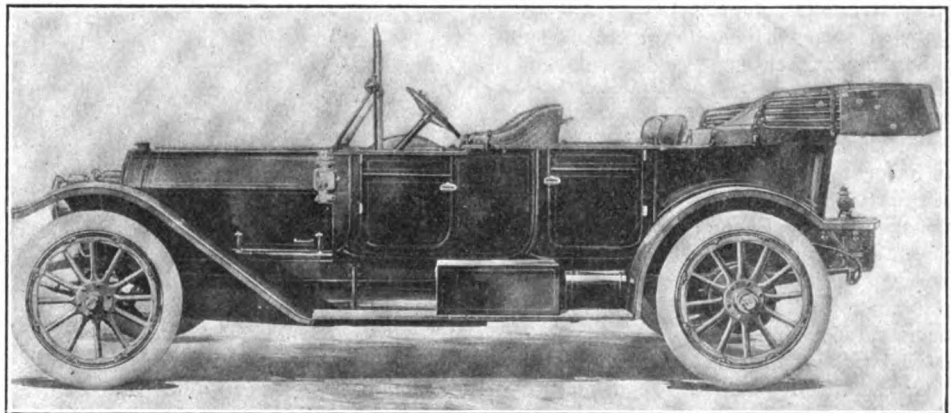
tings and finish, it is really a "show" car, and as such is one of the few of the kind on view. The engine hood and the running gear are a deep, rich blue, and the body is done in pure white, the effect being heightened by nickel-plated metal parts and upholstery, that is such a dark shade of purple as to be almost black. The usual style of side and head lights are replaced by parabolic reflector electrics and the appearance is made more distinctive by a low-sided body which gives the true straight-line effect. Door latches are inside and the hinges have been subdued until they scarcely are noticeable. There is that about the whole "job," as it is popularly referred to by the salesmen, which suggests speed and comfort, combined in a degree that has few equals. Though the Staver line has been somewhat depleted by the discontinuance of the popular 30-horsepower model, the loss is more apparent than real. Similarly, though a single chassis now is marketed, the statement requires modification inasmuch as two sizes of motor are used, which really makes the chassis into two chassis. The motors are of 35 and 40-horsepower, respectively, and are identical except as regards their bores. The bore of the smaller motor is $4\frac{3}{8}$ inches, and of the larger one $4\frac{1}{2}$ inches; the stroke in each case is five inches. Though the motors are new throughout—or rather they are of a new make, the Staver producers being among those who prefer to equip their cars with motors which are made by specialists—the distinctive feature of block cast cylinders with the valves on opposite sides is retained. One of the features of the motors of which the manufacturers are particu-



THE 40-HORSEPOWER KISSEL WITH "SEMI-TOURING" BODY

sides blend to a degree of nicety that is excelled by very few. The color scheme which is carried out is in maroon and black, the body proper being in maroon, striped with black and the hood and running gear being in a combination of the two colors that is pleasing to the eye. The line which last year embraced three chassis, this year has been filled out by the addition of another which is rated at 40-horsepower. Therefore there now are three four-cylinder chassis, rated at 30, 40 and 50-horsepower and one six-cylinder chassis rated at 60-horsepower. The 30, the 50 and the 60 remain substantially the same, but little improvement beyond a general refinement having been found necessary. Both the two higher-powered models still are distinguished as being among the few in the moderate priced class equipped with four-speed change gear mechanism in which the fourth speed is an overstep, and the third speed is direct drive. Which feature, it is explained, permits third speed to be used for all ordinary running, and the saving of gasoline and oil and wear and tear by the use of a higher gear ratio on level roads where greater speed is desirable. The 40-horsepower model is new right through, of course, though there is nothing radical or untried in its makeup. Instead it exhibits all the earmarks of careful design which mark the other cars in the line and like them gives evidence of much painstaking and thoughtful work. The cylinders are block cast and the bore and stroke are $4\frac{1}{2}$ inches and $4\frac{3}{4}$ inches, respectively. Particular attention is directed to the fact that by reason of light construction in which none of the requisite strength is sacrificed, the "Forty" is more than ordinarily econom-

really represents as much pure value for the price, which is \$3,000 fully equipped, as can be found in a long day's walk. Little if any change has been made in it during the past year, such slight refinements as have been made being largely of a minor nature. The motor dimensions are $4\frac{1}{2}$ inches bore and $4\frac{3}{4}$ stroke and special stress is laid on the fact that not only are parts ground, but



KISSEL, "SIX-SIXTY" SEVEN-PASSENGER CAR

they are lapped as well, which method of procedure, it is claimed, insures a perfection of fit which it is not possible to obtain in any other way. The wheelbase of the chassis is 132 inches, and it is regularly equipped with a variety of body styles, including roadster, touring, coupe and limousine.

Not far from the Kissel exhibit there is a Staver touring car propped up in the same way as the Kissel so as to form an effective background for the rest of the cars in the space. In the elaborateness of its fit-

larly proud is the lubricating system. It has been worked out with the idea of producing a "smokeless" engine, and is unique in several respects. Suspended below the crankshaft there are two separate shallow pans into which each pair of connecting rod big end bearings dip. In the sides of these pans there are a number of small holes through which the oil seeps. On the initial splash of the connecting rods, practically all the oil is thrown out of the pans and as it cannot seep back into them very fast, it is not possible to obtain sufficient

splash on subsequent revolutions to cause smoking, though plenty of oil to lubricate the cylinders and other moving parts is thrown out. Eleven styles of body in all, several of which may be mounted on either the 35 or 40-horsepower chassis, complete the line.

The Colby line which heretofore has been marked only by the inclusion of the more conventional type of over hung frame suspension, this year has as its leader an underslung car which therefore is quite dif-

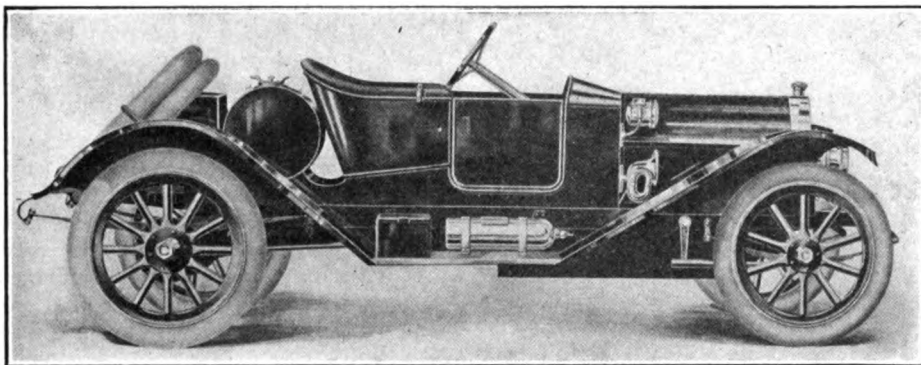
ferent from any of the other members of its immediate family. One complete car is exhibited, with a modish closed front touring body and the features of the underslung principle of construction are made more plain by a stripped chassis. Indications of its generous proportions are manifest in the fact that 36 x 4 tires on demountable rims are used, the wheelbase being 116 inches, and the road clearance 11 inches. The motor is of the block type with cylinders measuring 4 1-16 inches bore and 4 1/2 inches stroke and lubrication is effected by means of a cam-driven plunger pump located in the crankcase. In the evolution of the rear construction the manufacturers have designed a system in which they take particular pride. The change-gear mechanism is located on the rear axle and a torque tube performs the combined functions of a radius and torsion member. The tube itself extends forward and is attached to a cross frame member by means of a wide yoke around the forward universal joint. Torque and driving strains are sustained by heavy brackets securely riveted to the frame and forming the rear subframe hangers. In addition to the heavy torque tube the axle is braced with two strut rods which extend to the pins on which the yoke turns. In accordance with the usual underslung construction, both front and rear springs are of the semi-elliptic variety. Little or no change has been made in the two conventional overhung models, one of which is exhibited in closed front touring car form.

If there was one thing that does stand out in the show, just as it did at the New York shows, it is the number of roadsters that are exhibited. Plainly it indicates a return of the popularity which that type of

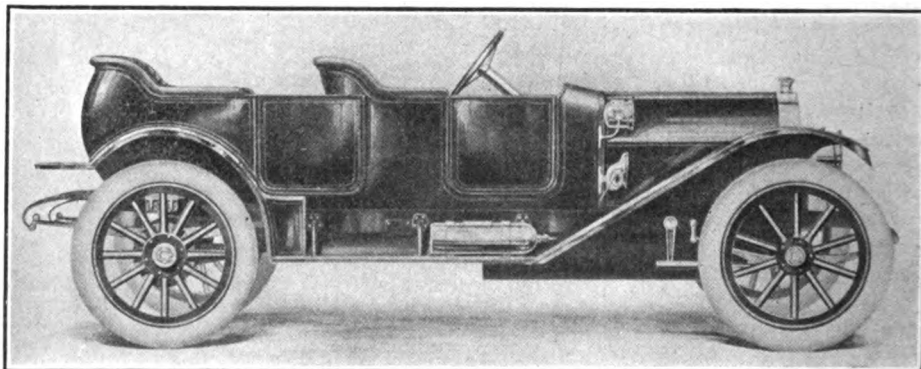
body once enjoyed. Among all the roadsters that are exhibited, however, it is doubtful if there is any which is more likely to turn the head of the show-goer than the Lexington which is exhibited in the Annex basement. In the first place it has a six-cylinder motor—the first “six” to be turned out of the Lexington plant—and for this reason alone is calculated to attract attention. But even without a glimpse under the hood, it is the type of roadster that appeals alike to the sporty fraternity, in-

ler, is on view. It is a modish five-passenger closed-front touring car finished completely in brown and in common with all the Lexington cars is equipped with a Prest-O-Starter and numerous other fittings calculated to increase the pleasure of motoring. One of the more noticeable refinements which have been made in both the four-cylinder models is the incorporation of the change-gear mechanism and the motor in a unit power plant than which none is more accessible by reason of the elimination of the usual underpan.

The Republic exhibit is another that is graced by an exceptionally attractive appearing roadster of the compartment type. The Republic line, it may be remembered made its first official show appearance in the Coliseum last year, when it at once took its place among the better class cars. Since that time it has undergone slight revision and alteration, though its original distinctive features remain, and in its present form, as might be expected by reason of the progressiveness of the manufacturers, it is even more appealing than it was at this time last year. But to return to the roadster, and there are not a few spectators who did return to it time and again, it is quite different in several respects from anything else in the show. Not the least of its distinctive features lies in the use of an auxiliary seat over the running board which when not in use slides in under the main seats in the form of a drawer. When the “drawer” is closed there is little beyond a small handle to indicate its presence, or that it really is a great deal more than a drawer. Its location necessitates the positioning of the gasoline tank in the rear



COLBY TORPEDO ROADSTER WHICH LISTS AT \$2,000



COLBY "40" WITH SPECIAL TORPEDO BODY

upholstery is in black patent leather and the whole is set off by nickel plated trimmings. The car is another which features a Rutenber motor—indeed a great many of the Western cars rely for power on the products of the Western Motor Co. Characteristic of the Rutenber design, the cylinders are separately cast and measure 4 3/8 x 5 1/4 inches bore and stroke. Included in the Lexington line there are two other models as well, a 40-horsepower model and a 45-horsepower model, both of them equipped with four-cylinder Rutenber motors, though but one of them, the smal-

compartment, of course, and below the compartment, and filling the blank between the rear axle and the body there is another compartment which serves to house the Prest-O-Lite tank and sundry small tools. Merely to say that the equipment of the car includes a windshield scarcely tells the whole story. It is really more than a windshield; it is a ventilating system as well. As is fairly well known, windshields generally are attached by means of what is styled a “filler board,” this being used to make the connection between the dash and the windshield. Strictly speaking, there is no filler

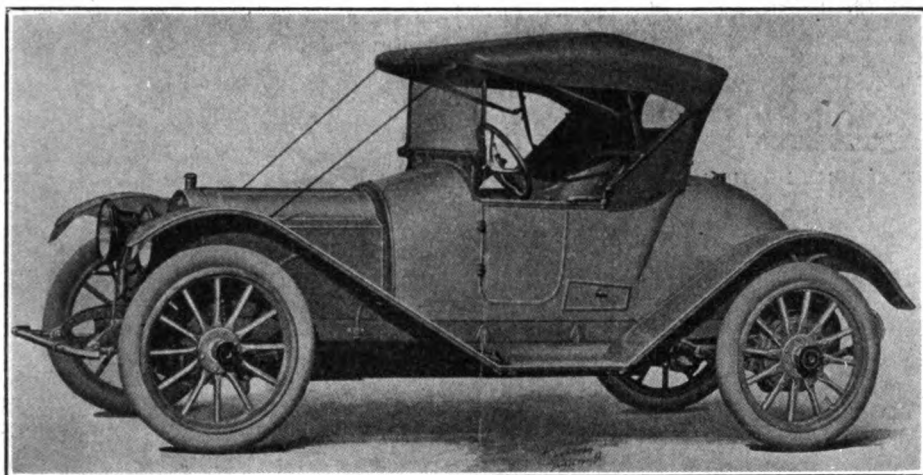
board on Republic cars for the skuttle is carried up to meet the lower edge of the windshield with which it is made integral. The windshield therefore is built right into the body and is an integral part of it. The value of the method of construction, barring the elimination of possible rattles and squeaks, is that it permits the incorporation of a unique type of ventilators in the upper part of the skuttle which takes the place of the "filler board." From the outside, these are merely funnel-shaped rectangular holes which serve to admit a current of air. Inside, they are fitted with deflectors to direct the air toward the floor. "Corliss" valves, operated by small levers, control the supply of air that is admitted. All the cars in the Republic line, it should be added, are equipped with the same windshield and ventilators; indeed this is a patented feature of which the manufacturers

creased from $4\frac{1}{4}$ to $5\frac{1}{2}$ inches; the bore remains the same at $4\frac{1}{4}$ inches. Most important among the other refinements which have been made and which are intended to increase the sweetness and uniformity of action of the car include the substitution of full-floating rear axles for the semi-floating members that were used last year, the use of Bosch ignition instead of Splitdorf and an increase in the size of tire equipment. Bodies are roomier than heretofore and their appearance has been enhanced by nicked instead of brass trimmings. As is the case with so many other makes, center control is a new feature and the equipment has been made more complete by the addition of a Prest-O-Starter.

Among the higher-priced and higher powered cars the Austin is distinctive not only for its exclusive tan and white finish, which finish it might be added was originated by

comfort. Thus, for instance, left-hand drive has been adopted as permitting at once the most natural driving position with the least restriction of the driver's compartment. By way of increasing simplicity of operation the emergency brake lever has been eliminated, its place being taken by a pedal fitted with a ratchet stop; the service brake is interconnected with the clutch pedal. In this respect it differs from all the other Austin models which are of the right-hand drive variety. As becomes an example of the latest engineering practice, the engine is fitted with an air-starting device, which is peculiar in that the rotary air distributing valve is held off its seat by a spring except when it is in actual use. The compressor is operated from the timing gear train through the intermediary of a block chain, and is thrown into or out of operation by a clutch controlled from the driver's seat. In addition to charging the air tank for starting the engine it also is equipped to be used for inflating tires. An electric lighting system is included in the equipment as a matter of course, and consists of Leece-Neville generator in combination with a storage battery of liberal capacity. Another of the distinctive and exclusive features of this truly remarkable car, and one which should prove more than appealing is the use of seat cushions that are no less than 16 inches in thickness. Between the front seats there is a small compartment for the storage of such small tools as may be required on the road, and this little "cubby hole" serves a double purpose in that it also houses a gasoline gauge. In attacking the problem of keeping the running boards clean, the manufacturers have hit upon the scheme of carrying spare tires in a horizontal compartment under the tonneau seats, entrance being by two wide doors at the back. In this way the tires are completely protected from the elements and their weight in this position tends to make the rear of the car "hold the road" better, perhaps, than it might if the tires were carried in the usual place. Two complete cars, one a small tonneau touring car and the other a full-sized seven-passenger touring car, and a polished chassis complete the exhibit. Though both of the cars are mounted on the new "77" chassis, two other chassis as well, are listed. They are of 50 and 45-horsepower, respectively. The several cars are listed with complete equipment, as they always have been; as a matter of fact, Austin cars were among the first to have included in the purchase price such items as top and windshields, together with the usual complement of tools, spare parts, lamps, horn, etc.

In common with so many of the other brands of car in the medium price class, the Cino line is another which during the past year has been expanded, the addition being a brand new six-cylinder model. That is to say, it is new in the sense that it never has been exhibited before, though not a few of the new models have been in the hands of owners for several months. The



REPUBLIC 35-HORSEPOWER COMPARTMENT ROADSTER

justly may be proud. Mechanically the line has changed but little, probably the greatest alteration being the hanging of the rear springs below the axles instead of over them. Which construction, together with the double drop frame increases the low-hung appearance of the cars and lowers the center of gravity considerably. Conforming to the general tendency, gear shift and emergency brake levers have been moved over to the center of the footboard.

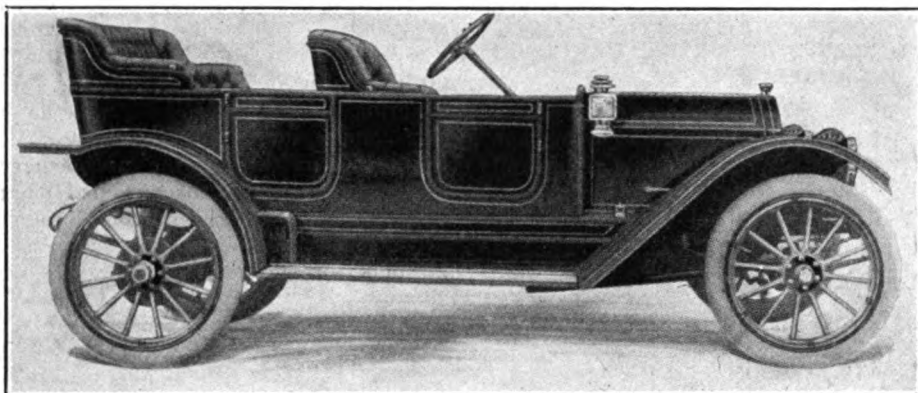
Still further evidence of the increasing popularity of the compartment roadster is uncovered at the stand where Davis cars are exhibited. This car too, employs a very deep skuttle, though it is not quite as deep as some that are exhibited. The body itself is finished completely in bright red, which in combination with black hood, mudguards and running gear gives an appearance that is distinctive, to say the least. This is another car in which the tendency toward block motors is apparent, the motor which has been used in the past and which featured pair-cast cylinders having been replaced by one in which all the cylinders are cast together. Though the rating remains practically the same, the actual power developed has been increased for the simple reason that the stroke has been in-

creased from $4\frac{1}{4}$ to $5\frac{1}{2}$ inches; the bore remains the same at $4\frac{1}{4}$ inches. Most important among the other refinements which have been made and which are intended to increase the sweetness and uniformity of action of the car include the substitution of full-floating rear axles for the semi-floating members that were used last year, the use of Bosch ignition instead of Splitdorf and an increase in the size of tire equipment. Bodies are roomier than heretofore and their appearance has been enhanced by nicked instead of brass trimmings. As is the case with so many other makes, center control is a new feature and the equipment has been made more complete by the addition of a Prest-O-Starter. Among the higher-priced and higher powered cars the Austin is distinctive not only for its exclusive tan and white finish, which finish it might be added was originated by

new model, together with the four-cylinder car which has been on the market for several years are the only ones that are manufactured, and as heretofore particular stress is laid on the fact that every part of both cars is made under the manufacturer's roofs, which, it might be added, cannot be said of very many of the later products. With either five or seven-passenger body, the wheelbase of the new "six" is 130 inches, and it employs a motor of the T-head type in which the cylinders measure 4 x 5

of excellence. Thus, for instance, the 40-horsepower motor now measures $4\frac{1}{2}$ inches by five inches, instead of $4\frac{3}{8}$ x $4\frac{7}{8}$, and the two larger chassis now have three-quarter elliptic instead of full-elliptic springs in the rear. Perhaps the most noteworthy change and one which evidences the policy of the company in adopting those essentials of modern engineering practice which have proven of real value, lies in the shifting of the control levers to the center of the footboard; the steering wheel, however, re-

sis, instead of one, as heretofore will be listed. The new car is styled the Glide "36," the appellation serving to indicate the horsepower and to distinguish it from its older brother, which is of 45-horsepower. Except for such slight refinements as experience has indicated, the older model scarcely has changed a bit. Naturally, the "36" is quite new in its design and construction, and differs materially from that which has characterized Glide cars in the past; left-hand drive and centre control are one of its principal points of difference. Simplicity has been the feature most sought in the evolution of the car, and to this end motor, change-gear mechanism and control levers form a single unit which may be lifted out of the chassis intact, or each separate part may be removed without the necessity for disturbing the others. The motor is of the L-head with enclosed valve stems and springs, and the cylinders measure $4\frac{1}{8}$ x $5\frac{1}{4}$ inches bore and stroke. For the transmission of power a multiple disk clutch of 14 plates, the alternate plates being faced with Raybestos, and a three-speed selectively operated change-gear set are used. The rear axle is of the full-floating type and the brakes, internal expanding and external contracting are carried on the rear wheels. The wheelbase is 114 inches. Externally, the new car presents a pleasing appearance, the straight-line effect being enhanced by electric side lights cleverly set into the dash in such a way that they are all but invisible except when lighted. The head lights are operated by Prest-O-Lite tank. As only one indication of the

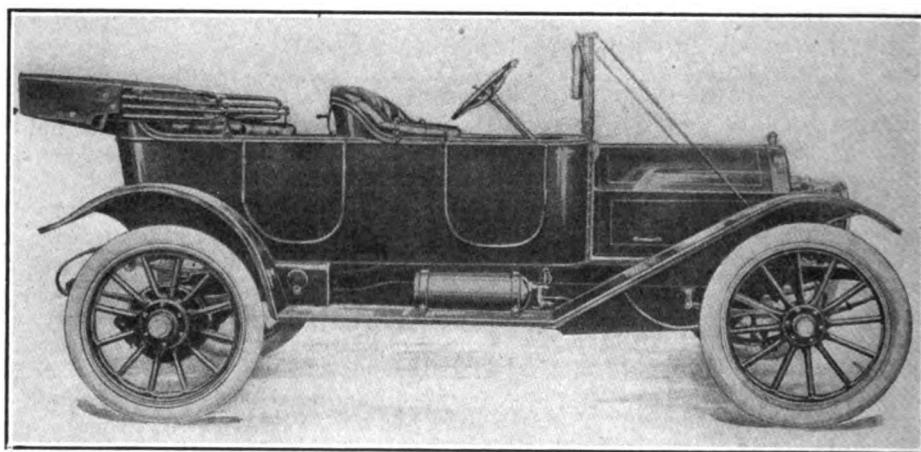


CROW-ELKHART CLOSED FRONT TOURING MODEL

inches. Other excellent features of the car are a large cone clutch with spring inserts, three-speed selectively operated change-gear mechanism, full-floating rear axle and worm and double nut type of steering gear. The rim and tire equipment includes Baker bolted-on demountable rim and 36 x $4\frac{1}{2}$ inches tires all around. In the four-cylinder model the manufacturers allow the unique option of either $4\frac{1}{2}$ x 5 T-head motor or $4\frac{3}{8}$ x 5 overhead valve motor, though in this connection it is explained that the touring cars regularly are equipped with the T-head motor and the roadsters with the other. Either will be supplied at the option of the purchaser, however. Except for slight refinement of detail the car remain substantially the same as heretofore, its other essential elements such as change-gear mechanism, clutch and rear axle being of the same type as are used in the six-cylinder model.

The expansion of the Crow-Elkhart line which last year brought the total number of chassis up to five from two, and the total number of body styles up to 11, has been deemed sufficient for the coming season, except that two new body styles have been added, making 13 in all. As for the five chassis, that they remain practically unchanged is almost certain indication that this design and construction have been impossible of improvement. The five power plants which are used are of 25, 33, 38, 40 and 45-horsepower, respectively, and it scarcely is necessary to add that few other lines of popular-priced cars on the market permit as wide a range or as great a latitude for choice. Slight changes have been made in one or two of the chassis, of course, for it is the policy of the company to maintain its products at the top notch

in its customary place at the right side. The distinctive gear-shifting arrangement by means of which three speeds forward and reverse are obtained selectively by simply moving the lever either straight forward or backward, according to the gear that is wanted, in a single slot, is retained. Bodies have been made roomier and



NEW FIVE-PASSENGER SELF-STARTING GLIDE "36"

their lines have been modified to present a straight-line effect, as a matter of course. Equipment also has been increased, and not the least important addition is a gasoline gauge arranged in the top of the gasoline tank where it may be inspected by simply raising the cushion. By way of still further filling out the line, it is announced that a six-cylinder model will be added next year.

Several years of development along pretty well standardized lines have resulted in the expansion of the products of the Bartholomew Co., known individually as the Glide cars, and for the coming season two chas-

liberality of the manufacturers, it is interesting to note that standard equipment which consists of top, windshield, electric side and tail lamps, demountable rims with one spare rim, full quota of tools, spare parts, horn, etc., also includes an engine-starter of the acetylene type. The price of the car, including such equipment is \$1,550.

The Cunningham line is another in which the manufacturers have been content to center their attention on the production of a single chassis, and it might be said in passing that so careful has been the designing and so thoughtful the carrying out of the

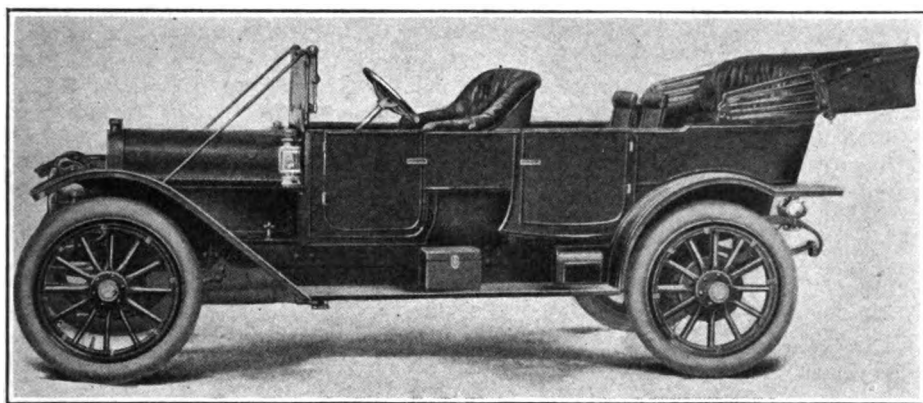
work of the designing room that during the past few years it has not been found necessary to make a single radical change in construction. From stem to stern, the car rightfully belongs in the class of higher priced vehicles in which the individuality of the manufacturers is manifest in every little detail. Having elected to use the overhead valve system, as being in their opinion productive of the best results, and the greatest efficiency, the manufacturers have consistently clung to it and now, as has been the case in years gone by, it continues to be one of the distinguishing marks by which Cunningham cars may be identified. Similarly, the distinctive feature of aluminum housings by means of which the valve mechanism is enclosed is retained in the same form in which it originally made its appearance. Typifying modern

other cardinal features, in spring suspension, for instance, few motorists know or take the time to find out. As a matter of fact, the spring suspension of an electric pleasure car is a feature which claims a great deal more attention than generally is supposed to be the case for there are comparatively delicate storage batteries to be carried about over all kinds of roads, even relegating the comfort of passengers to second place. Which factor has been borne in mind constantly by the manufacturers of Woods electrics. Indeed so much attention has been paid to it and so carefully has the problem been worked out that it is claimed Woods cars operate on solid tires more efficiently than do any other electrics on any kind of tires. Of course it has required considerably study and experiment to reach the stage of per-

position of the controller has been changed slightly to facilitate inspection and one of the new features of which the manufacturers are particularly proud is that every bit of wiring now is enclosed in conduit whereby short circuits are rendered impossible. Similarly, all the working parts, such as the motor, the controller and the transmission mechanism now are fully enclosed and protected from dust and dirt. Several new body styles have been added and prominent among them is a five-passenger limousine in which all the passengers face forward.

The Rauch & Lang line is another which has been increased in size by the addition of a larger car in which five passengers facing forward can be accommodated. Several other body styles also are included, and though they correspond to the general types which have been marketed in the past, they are larger than heretofore and the fittings are more luxurious. Yearly models, as the term generally is understood, never have been a feature of the Rauch & Lang line, and it is pointed out that the yearly catalog which makes its appearance at about this time is merely a record of such advances as have been made in the past year. Apparently little room for improvement has been found in the past year for except for a general enlargement of bodies and a smoothing down and refinement of detail little change is noticeable. The wheelbase of the two chassis has been increased four inches to 109 inches, the frame has been given slightly more drop further to lower the center of gravity of the car, and larger wheels now are used, these constituting the principal changes. As heretofore two chassis are built, one of the shaft drive type, drive from the motor to the shaft being by means of a "silent" chain, and the other double side chain drive. On the chain driven models chain cases have been added. Among the distinctive features may be noted the three sets of brakes which are used. One of them is located on the rear wheels, and is operated by means of the orthodox pedal; another is located on the propeller shaft and is operated by simply moving the controller handle backward past the neutral position; the third is a magnetic brake, the controller being so constructed that as soon as current is shut off the motor is converted into a generator, and in generating current absorbs some of the energy represented by the momentum of the car.

Among the new electrics which are making their first show appearance of the year is the Borland brougham. In the production of these cars, two chassis and a number of body styles serving to complete the line, nothing of a radical nature has been attempted. Instead standard construction has been adhered to in every respect. The chain driven model is the older of the two and though it has been on the market for some time it is perhaps not so familiar to the motoring public as it might be, for the simple reason that never before has it ap-



CUNNINGHAM IN SEVER-PASSENGER TOURING FORM

practice, clutch and flywheel are enclosed in a unit housing with the engine crankcase and the change-gear mechanism and the whole is supported at four points on the chassis frame. Another of the distinctive features on which the manufacturers lay stress is the offset cylinders, which construction, it is claimed, eliminates much of the wear on pistons and cylinders. Two cars only are exhibited, one of them a luxurious limousine and the other a cleverly designed and beautifully finished closed front touring car. The latter is more than ordinarily attractive, and is finished in deep purple striped with a narrow band of black, on which is traced a hair-line of gold. The upholstery is in a slightly lighter shade of purple, and the whole is set off by nicked trimmings. Equipment is complete, of course, and includes such standard products as Warner meter, Bosch ignition apparatus, top, windshield, demountable rims with two spare rims, shock absorbers and the usual complement of tonneau fittings.

Electric pleasure cars are very different from gasoline pleasure cars. That is to say, everybody who knows anything at all about automobiles knows that an electric is driven by an electric motor actuated by a storage battery whereas a gasoline car is propelled by an internal combustion motor. But just how much they differ in

fection which has been reached and the fruits are revealed in the fact that these cars always have been, and according to the manufacturers always will be, constructed exclusively to use solid tires. Which, it is explained, requires special springs and that they may be all that the manufacturers desire they are made right in their own factory of material which is imported for the purpose. The distinctive three-quarter platform front spring suspension and the scroll full-elliptic rear members which are used have been a feature of Woods electrics for years during which time they have proven so satisfactory that it has not been found necessary to change them at all. Further to increase the easy riding qualities of the cars and their efficiency special tires also are used, the compound having been determined after exhaustive tests that proved its worth beyond cavil. Mechanically the chassis have been altered not a little in the past year, though none of the changes are of a radical nature, nor do they effect the essential parts such as the motor and the controller. The method of drive from the motor to the shaft has been changed from chain to herringbone gear, though the flexible motor suspension which in combination with a torque tube enclosing the propeller shaft permits the elimination of all universal joints, has been retained. The

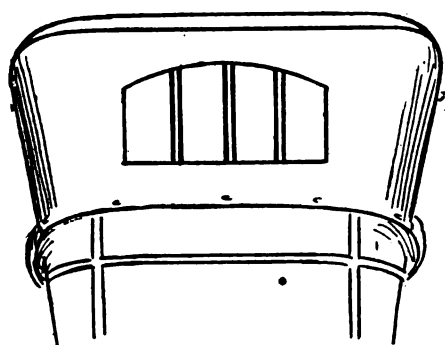
peared at a national show. The motor is of General Electric manufacture, and is accessible for inspection and care of the brushes. Power from the motor is transmitted to the jack shaft through the intermediary of a "silent" chain running in oil and enclosed in a phosphor bronze housing. Final drive is by double side chain to the rear wheels. The controller also is of General Electric manufacture and is of the constant torque drum type operated by means of lever at the side of the driver. For the shaft driven model, the same general specifications obtain, drive to the propeller shaft being by means of a "silent" chain operating in a phosphor bronze housing in a bath of oil. One of the features that is common to both is that by means of suitable connections the power is shut off immediately the emergency brake is applied, and cannot again be turned on until the brake has been released and the con-

troller returned to the neutral position. The wheelbase of both models is 92 inches and tire equipment may be either solid or pneumatic at option of the purchaser.

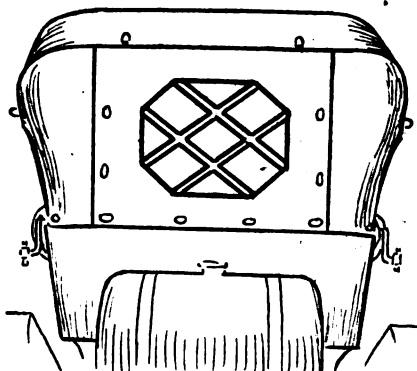
By reason of the general trend toward simplification which everywhere is apparent, the manufacturers of the Broc electrics take particular pride in the fact that their own distinctive type of combined controller and brake lever which was adopted last year and which was a big step toward simplifying the mechanism of the car is retained in the current models in exactly the same form in which it originally was produced. By a simple movement forward the current is turned on; movement of the lever backward past the neutral position applies the brake which is further characterized by being located between the motor and the rear axle where no strain on the transmission chain is possible. Three chassis in all are made though they differ

only in regard to their wheelbase, which is 85, 95 and 100 inches, according to the type of body which is mounted. Final drive is by shaft to bevel pinion differential.

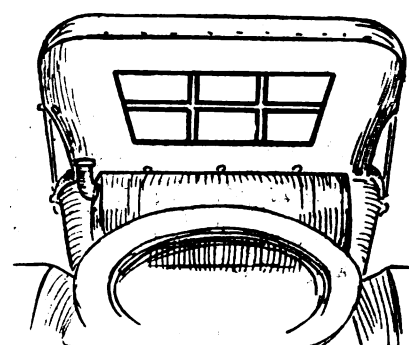
Another of the many features to which the manufacturers direct attention is that because of the use of high grade materials and ball bearings throughout the vehicles are exceptionally light in weight, and easy running, both of which factors make for economy of operation. In all the models all windows are arranged to drop into pockets in the sides, front windows being somewhat out of the ordinary in that the top sash rail is independent. Which is to say that when the window is lowered the top sash remains in place attached to the window casing with which it is made integral. Thus there is little to obstruct the view of the occupants of the carriage with the window in either position.



PREMIER



REO



MOLINE

Summary of the Pleasure Cars Exhibited at the Chicago Show

Abbott Motor Co., Detroit, Mich.—One four-cylinder Abbott-Detroit touring car.

American Locomotive Co., Providence, R. I.—Two Alco cars; one six-cylinder touring car, and one six-cylinder chassis.

American Motors Co., Indianapolis, Ind.—Three American underslung cars; two four-cylinder touring cars, one four-cylinder roadster and one four-cylinder chassis.

Auburn Auto Co., Auburn, Ind.—Two four-cylinder Auburn touring cars and one four-cylinder chassis.

Austin Auto Co., Grand Rapids, Mich.—Two six-cylinder Austin touring cars and one six-cylinder chassis.*

Bartholomew Co., Peoria, Ill.—Three four-cylinder Glide touring cars.*

Bergdoll Motor Co., Louis J., Philadelphia, Pa.—Two four-cylinder Bergdoll cars; one touring car, one limousine, and one four-cylinder chassis.

Brush Runabout Co., Detroit, Mich.—Three one-cylinder Brush runabouts, two four-cylinder Courier cars: one touring car, one roadster, and one four-cylinder chassis.

Buick Motor Co., Flint, Mich.—Four four-cylinder Buick cars; three touring cars

and one roadster, and one four-cylinder chassis.

Cadillac Motor Co., Detroit, Mich.—Four four-cylinder Cadillac cars: two touring cars, one double limousine and one coupe and one four-cylinder chassis.

Cartercar Co., Pontiac, Mich.—Three four-cylinder, friction driven Cartercars: two touring cars and one coupe, and one four-cylinder chassis.

Case, J. I. Co., Racine, Wis.—Three four-cylinder Case cars: one touring car, one coupe and one roadster, and one four-cylinder chassis.

Chalmers Motor Co., Detroit, Mich.—Four Chalmers cars: two four-cylinder touring cars, one four-cylinder roadster, one six-cylinder touring car, and one four-cylinder chassis.

Clark-Carter Automobile Co., Jackson, Mich.—Three four-cylinder Cutting cars: two touring cars and one roadster.

Colby Motor Co., Mason City, Ia.—Two four-cylinder Colby touring cars and one four-cylinder chassis.*

Cole Motor Car Co., Indianapolis, Ind.—Three four-cylinder Cole cars: two touring cars and one roadster, and one four-cylinder chassis.

Columbus Buggy Co., Columbus, Ohio—

Two four-cylinder Firestone-Columbus cars: one touring car and one roadster.

Columbia Motor Car Co., Hartford, Conn.—Three four-cylinder Columbia-Knight cars: two touring cars, one limousine, and one four-cylinder Columbia-Knight chassis.

Corbin Motor Vehicle Corp., New Britain, Conn.—Four four-cylinder Corbin cars: two touring cars, one roadster and one limousine.

Crow Motor Car Co., Elkhart, Ind.—Three four-cylinder Crow-Elkhart cars: two touring cars and one roadster.*

Cunningham & Son, James, Rochester, N. Y.—Two four-cylinder Cunningham Cars: one touring car and one limousine.*

Davis Carriage Co., Richmond, Ind.—Two four-cylinder Davis cars: one touring car and one roadster.*

Dayton Motor Car Co., Dayton, Ohio—Four Stoddard-Dayton cars: one six-cylinder double limousine with Knight motor, two four-cylinder touring cars, one roadster and one four-cylinder chassis.

De Tamble Motor Co., Anderson, Ind.—Three four-cylinder De Tamble cars: two touring cars and one roadster.

Elmore Mfg. Co., Clyde, Ohio—Three four-

cylinder, two-cycle Elmore cars; two touring cars and one roadster.

Fiat Automobile Co., Poughkeepsie, N. Y.—Two Fiat cars: one six-cylinder touring car, one four-cylinder landaulet, and one six-cylinder chassis.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Four Franklin air-cooled cars: two six-cylinder touring cars, one six-cylinder limousine, and one four-cylinder touring car.

Garford Co., The, Elyria, Ohio—Three Garford cars: one six-cylinder touring car, one six-cylinder limousine, and one four-cylinder touring car.

Great Western Automobile Co., Peru, Ind.—One four-cylinder Great Western touring car, and one four-cylinder chassis.

Haberer & Co., Cincinnati, Ohio—Two Cino cars: one six-cylinder touring car and one four-cylinder racer, and one six-cylinder chassis.*

Haynes Automobile Co., Kokomo, Ind.—Five four-cylinder Haynes cars: one touring car, one coupe, one roadster, one limousine, one small tonneau, and one four-cylinder chassis.

Hudson Motor Car Co., Detroit, Mich.—Three four-cylinder Hudson cars: two touring cars, one roadster, and one four-cylinder chassis.

Hupp Corporation, Detroit, Mich.—Two four-cylinder R-C-H cars: one touring car and one roadster.

Hupp Motor Car Co., Detroit, Mich.—Four four-cylinder Hupmobile cars: one touring car, one coupe, two roadsters, and one four-cylinder chassis.

Ideal Motor Car Co., Indianapolis, Ind.—One four-cylinder Stutz touring car, and one four-cylinder chassis.

Imperial Automobile Co., Jackson, Mich.—Two four-cylinder Imperial touring cars.

Inter-State Automobile Co., Muncie, Ind.—Two four-cylinder Inter-State cars: one touring car, one roadster, and one four-cylinder chassis.

Jackson Automobile Co., Jackson, Mich.—Four four-cylinder Jackson cars: three touring cars and one roadster.

Jeffery Co., Thos. B., Kenosha, Wis.—Four four-cylinder Rambler cars: three touring cars, one limousine, and one four-cylinder chassis.

King Motor Car Co., Detroit, Mich.—Two four-cylinder King cars: one coupe, one touring car, and one four-cylinder chassis.

Kissel Motor Car Co., Hartford, Wis.—Four Kissel cars: one six-cylinder touring car, one four-cylinder small tonneau, two four-cylinder touring cars, and one four-cylinder chassis.*

Knox Automobile Co., Springfield, Mass.—Five Knox cars: one six-cylinder roadster, two six-cylinder touring cars and two four-cylinder touring cars.

Krit Motor Car Co., Detroit, Mich.—Two four-cylinder Krit cars: one touring car, one roadster, and one four-cylinder chassis.

Lexington Motor Car Co., Thomasville, Ind.

—Two Lexington cars: one six-cylinder roadster and one four-cylinder touring car.*

Lion Motor Car Co., Adrian, Mich.—Two four-cylinder Lion cars: one roadster, one touring car, and one four-cylinder chassis.

Locomobile Co. of America, Bridgeport, Conn.—Four Locomobile cars: three six-cylinder touring cars, one four-cylinder touring car, and one six-cylinder chassis.

CENSUS OF THE SHOW

Total Exhibitors.....	282
Exhibitors of Cars.....	98
Exhibitors of Accessories..	184

Gasolene Cars.

One Cylinder.....	3
Two Cylinders.....	1
Four Cylinders.....	183
Four Cylinders (two-cycle)....	5
Four Cylinders (sleeve valve)..	5
Six Cylinders.....	55
Six Cylinders (sleeve valve)..	1

Total Gasolene Pleasure Cars.....	253
Touring Cars.....	169
Roadsters	52
Closed Cars.....	32

Air Cooled Cars.....	4
Water Cooled Cars.....	249

Chassis.

Four Cylinders.....	38
Six Cylinders.....	16
	54

Electric Cars.

Coupes	26
Broughams	1
Limousines	4
Roadsters	1
Phaetons	2
Chassis	3

	37
Grand Total all Cars and Chassis..	344

Lozier Motor Co., Detroit, Mich.—Four Lozier cars: one six-cylinder double limousine, two six-cylinder touring cars, one four-cylinder racer, and one six-cylinder chassis.

McFarlan Motor Car Co., Connersville, Ind.—Two six-cylinder McFarlan touring cars.

McIntyre Co., W. T., Auburn, Ind.—Two four-cylinder McIntyre touring cars.

Marquette Motor Co., Saginaw, Mich.—Four four-cylinder Marquette cars: three touring cars, and one roadster.

Matheson Automobile Co., Wilkes-Barre, Pa.—Two six-cylinder Matheson cars: one double limousine, one touring car, and one six-cylinder chassis.

Maxwell-Briscoe Motor Co., Tarrytown, N.

Y.—Five four-cylinder Maxwell cars: three touring cars, two roadsters, and one four-cylinder chassis.

Metzger Motor Car Co., Detroit, Mich.—Four Everitt cars: one six-cylinder roadster, one six-cylinder touring car, two four-cylinder touring cars, and one six-cylinder chassis.

Michigan Buggy Co., Kalamazoo, Mich.—Three four-cylinder Michigan cars: one roadster and two touring cars.

Mitchell-Lewis Motor Co., Racine, Wis.—Four Mitchell cars: two six-cylinder touring cars, one four-cylinder roadster, one four-cylinder touring car, and one six-cylinder chassis.

Moline Automobile Co., East Moline, Ill.—Two four-cylinder Moline cars: one touring car, and one roadster.

Moon Motor Car Co., St. Louis, Mo.—Two four-cylinder Moon cars: one roadster, one touring car, and one four-cylinder chassis.

National Motor Vehicle Co., Indianapolis, Ind.—Four four-cylinder National cars: one roadster, two touring cars, and one small touring car.

Nordyke & Marmon Co., Indianapolis, Ind.—Four four-cylinder Marmon cars: one touring car, one roadster, one limousine, one racer, and one four-cylinder chassis.

Oakland Motor Car Co., Pontiac, Mich.—Four four-cylinder Oakland cars: three touring cars, one roadster, and one four-cylinder chassis.

Ohio Motor Car Co., Cincinnati, Ohio—Three four-cylinder Ohio cars: two touring cars, and one roadster.

Olds Motor Works, Lansing, Mich.—Four Oldsmobile cars: one six-cylinder touring car, two four-cylinder touring cars, and one four-cylinder coupe.

Ottomobile Co., Philadelphia, Pa.—One four-cylinder Otto roadster, and one four-cylinder chassis.

Packard Motor Car Co., Detroit, Mich.—Two Packard cars: one six-cylinder phaeton and one four-cylinder limousine, and one six-cylinder chassis.

Paterson Co., W. A., Flint, Mich.—Two four-cylinder Paterson touring cars.

Peerless Motor Car Co., Cleveland, Ohio—Four Peerless cars: one six-cylinder double limousine, one four-cylinder limousine, and two six-cylinder touring cars.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Three six-cylinder Pierce-Arrow touring cars, and one six-cylinder chassis.

Pope Manufacturing Co., Hartford, Conn.—Four Pope-Hartford cars: one six-cylinder touring car, one six-cylinder roadster, one four-cylinder touring car, one four-cylinder limousine, and one six-cylinder chassis.

Premier Motor Mfg. Co., Indianapolis, Ind.—Three Premier cars: one six-cylinder touring car, one six-cylinder double limousine, one four-cylinder touring car, and one six-cylinder chassis.

Pullman Motor Car Co., York, Pa.—Three Pullman cars: one six-cylinder touring

car, and two four-cylinder touring cars. Regal Motor Car Co., Detroit, Mich.—Four four-cylinder Regal cars: two small touring cars, one coupe, one touring car, and one four-cylinder chassis.

Reo Motor Car Co., Lansing, Mich.—Three four-cylinder Reo cars: one roadster, two touring cars, and one four-cylinder chassis.

Republic Motor Car Co., Hamilton, Ohio—Two four-cylinder Republic cars: one touring car, one roadster, and one four-cylinder chassis.*

Selden Motor Vehicle Co., Rochester, N. Y.

Streator Motor Car Co., Streator, Ill.—Two four-cylinder Halladay touring cars and one four-cylinder chassis.*

Studebaker Corporation, Detroit, Mich.—Three four-cylinder E-M-F cars: one double limousine, one roadster, one touring car, two four-cylinder Flanders cars, one touring car, one roadster, and one-half of one four-cylinder chassis.

Thomas, E. R., Motor Car Co., Buffalo, N. Y.—Three six-cylinder Thomas touring cars and one six-cylinder chassis.

Warren Motor Car Co., Detroit, Mich.—Three four-cylinder Warren cars: two

Electric Pleasure Cars.

—Four Detroit electric cars; three coupes and one limousine.

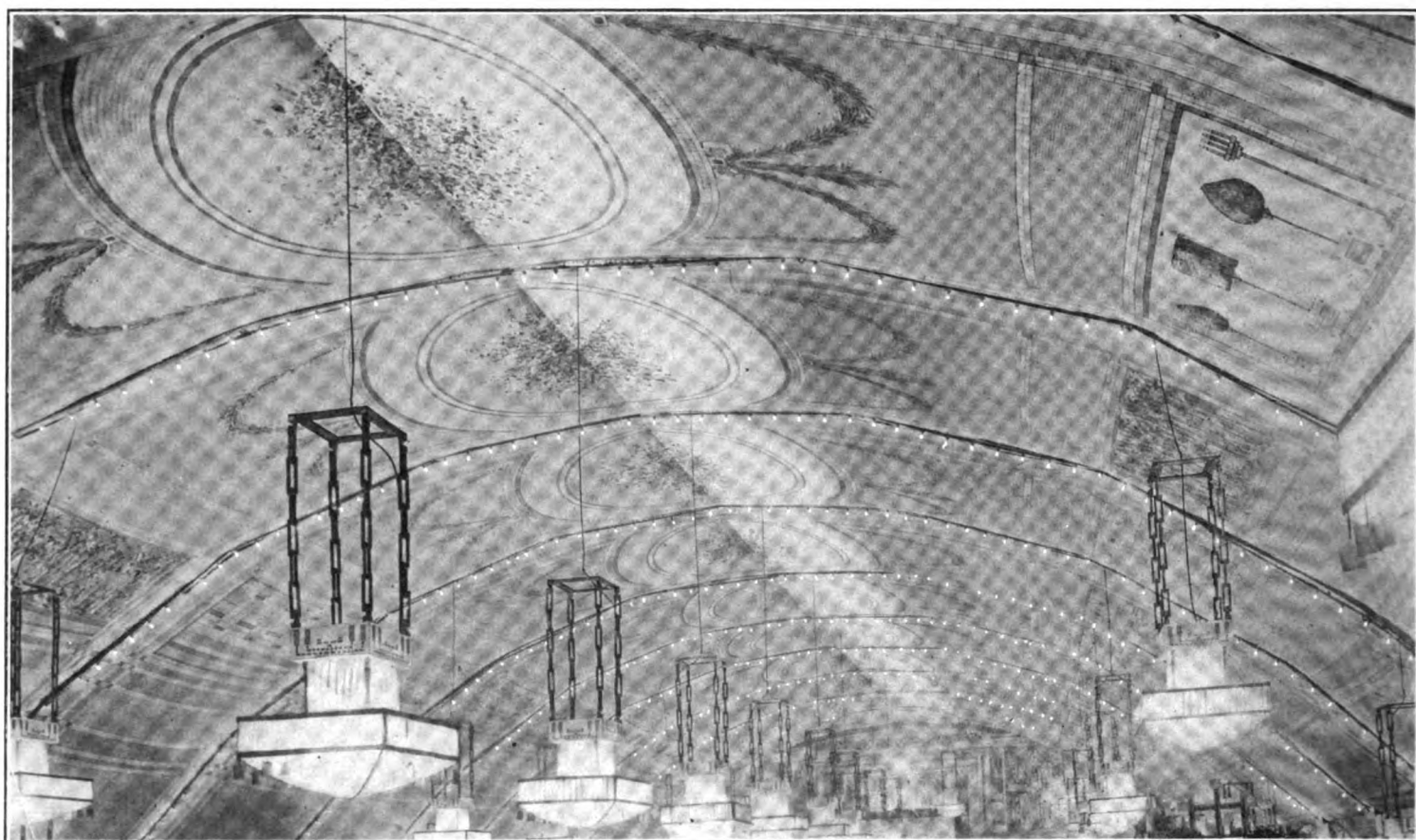
Baker Motor Vehicle Co., Cleveland, Ohio—Five Baker electric cars: three coupes one limousine and one roadster.

Borland-Grannis Co., Chicago, Ill.—Two Borland electric broughams.*

Broc Electric Vehicle Co., Cleveland, Ohio—Three Broc electric coupes.*

Columbus Buggy Co., Columbus, Ohio—Two Columbus electric coupes.

Flanders Mfg. Co., Pontiac, Mich.—One Flanders electric coupe.



INTIMATE VIEW OF THE NEAR-MOSAIC "ROOFING" IN THE COLISEUM

—Three four-cylinder Selden cars: one limousine, two touring cars, and one four-cylinder chassis.

Simplex Motor Car Co., Mishawaka, Ind.—One four-cylinder, two-cycle Amplex touring car, and one four-cylinder chassis.

Staver Carriage Co., Chicago, Ill.—Two four-cylinder Staver cars: one small, and one large touring car, and one four-cylinder chassis.*

Stearns Co., F. B., Cleveland, Ohio—Two four-cylinder Stearns-Knight touring cars, and one four-cylinder Stearns-Knight chassis.

Stevens-Duryea Co., Chicopee Falls, Mass.—Four six-cylinder Stevens-Duryea cars: two touring cars, one roadster, and one limousine, and one six-cylinder chassis.

touring cars, one roadster and one four-cylinder chassis.

Westcott Motor Car Co., Richmond, Ind.—Two four-cylinder Westcott cars: one touring car, and one roadster.

White Co., The, Cleveland, Ohio—Six White cars: one six-cylinder touring car, three four-cylinder touring cars, one four-cylinder roadster, and one four-cylinder double limousine.

Willys-Overland Co., Toledo, Ohio—Four four-cylinder Overland cars: three touring cars, one roadster, and one four-cylinder chassis.

Winton Motor Carriage Co., Cleveland, Ohio—Four six-cylinder Winton cars: three touring cars, one double limousine, and one six-cylinder chassis.

Hupp Corporation, Detroit, Mich.—Two Hupp-Yeats electric coupes.

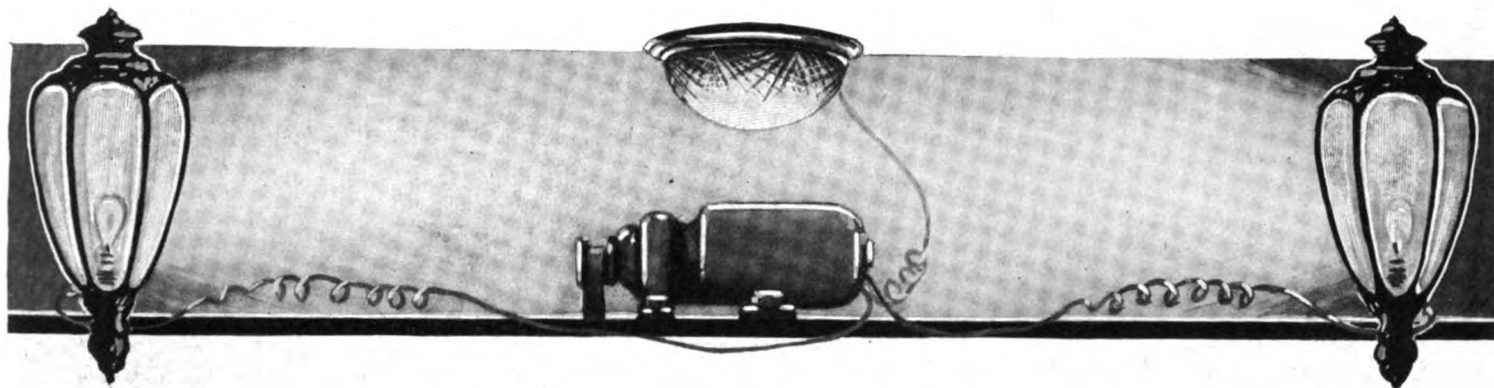
Ohio Electric Car Co., Toledo, Ohio—Four Ohio electric cars: one victoria, one brougham and two coupes.

Rauch & Lang Carriage Co., Cleveland, Ohio—Three Rauch & Lang electric cars: two coupes and one limousine and one electric chassis.*

Standard Electric Car Co., Jackson, Mich.—Two Standard electric coupes and one electric chassis.

Waverley Co., Indianapolis, Ind.—Three Waverley electric cars: two coupes and one phaeton.

Woods Motor Vehicle Co., Chicago, Ill.—Three Woods electric cars: two coupes and one five-passenger limousine, and one electric chassis.*



THE ACCESSORY DISPLAY AT THE CHICAGO SHOW

It Is Much Smaller Than the New York Exhibit, But One Old Maker Uncovers Two Radically New Engines—Several Minor Novelties Also Come to the Surface.

Compared with the accessory department of the Madison Square Garden show in New York, the Chicago show is a half-portion affair, as always has been the case. While 329 displays of accessories were uncovered in New York this year less than 200 are in evidence in Chicago, and of the number most of the exhibitors who have confined themselves to Chicago are neither very large nor very important, which does not imply, however, that their wares are not useful or are lacking in interest.

Perhaps the most surprising absentee from New York was the Michelin Tire Co., of Milltown, N. J. By the same token, the most conspicuous of the "Chicago only" exhibitors is the same Michelin company, but the Michelin productions are so well and so widely known that none of them can be classed as either new or novel—not even the demountable twin pneumatic tire and rim, which made its appearance several months since.

Perhaps the most striking feature of the Chicago accessory department is the fewness of engine-starters and the utter lack of new developments in that line. Since the engine-starter movement attained real force six months ago those inventions have cropped up in the West like mushrooms, and yet for some inexplicable reason the Chicago show was practically barren of them.

But that other feature of the Chicago exhibition which always has been its characteristic still remains a part of it: i. e., the number of engine manufacturers, several of them large and important, who never have displayed their wares in the East. This applies even to such well-known productions as the Continental and Rutenber motors, not to mention the Model, Wisconsin, Falls and Waukesha. While the fact seems strange it is easily accounted for; the great strength of the automobile industry lies in the West, and

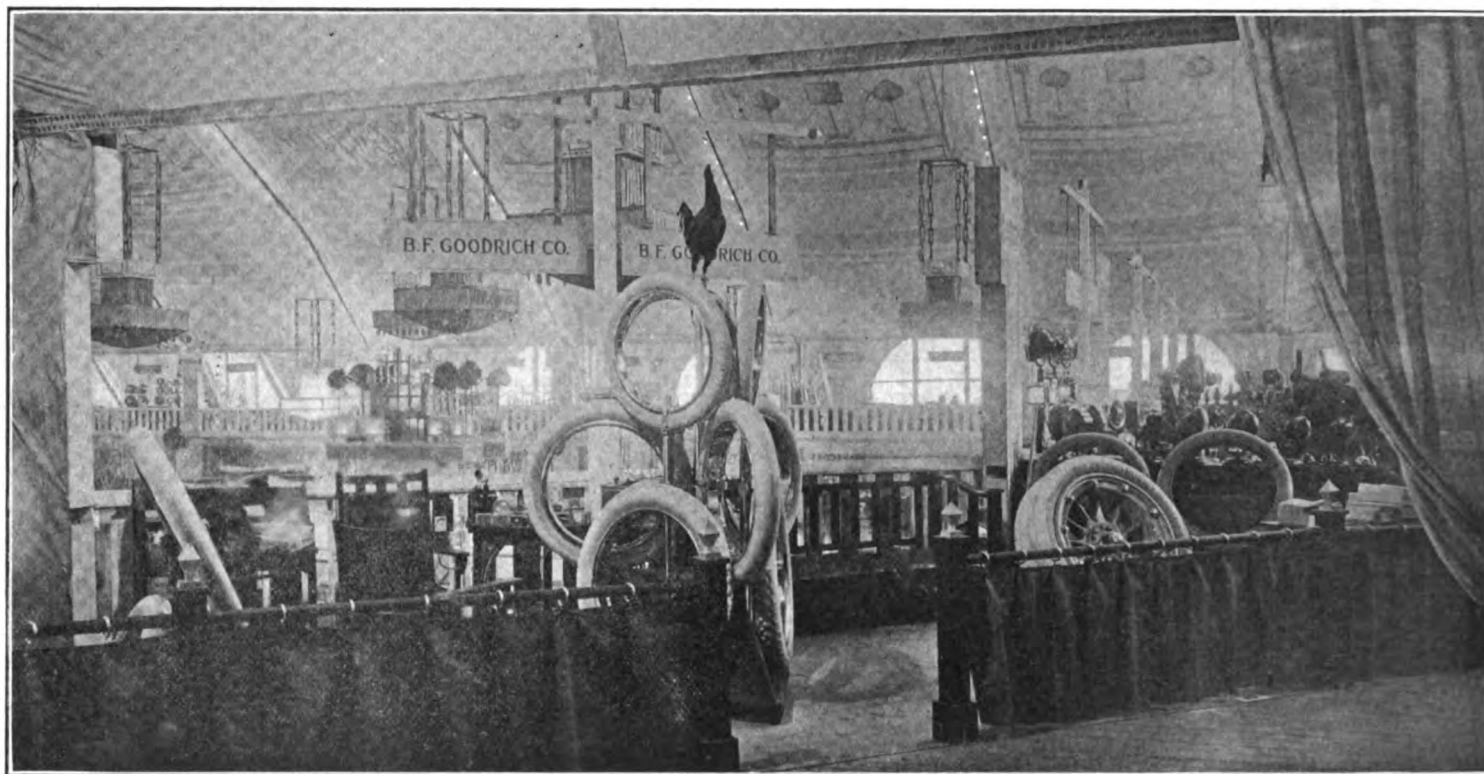
it is there that the assembled car flourishes most luxuriantly.

It is at the exhibit of the Model Gas Engine Works, manufacturer of the Peru engines, that the real surprises of the show are revealed, however. Though one new type of motor was not altogether unexpected not only the one, but two are revealed, the former being of the rotary valve type, operating on a principle similar to the more or less familiar Reynolds engine, and the latter being of the orthodox poppet valve type but differing from the usual motor in that its flywheel is replaced by a combination motor and generator which serves on occasion either as an engine-starter or as a generator to recharge the storage battery. The rotary valve motor differs from the Reynolds motor, however, in that the valves themselves are so located that they are directly in the combustion chamber instead of outside of it. They are of phosphor bronze, operating on cast iron seats, and are carried on spindles below the gear wheels which operate them. The gear wheels form a train which is actuated by a smaller gear which meshes with one of the large gear wheels and is mounted on a vertical shaft between the pairs of cylinders. The vertical shaft is worm driven from the crankshaft. Otherwise the motor differs but little from the poppet valve motors in the Peru line, cylinders being cast in pairs and measuring $5 \times 5\frac{1}{2}$ inches. Similarly, the other new Peru motor differs from its brothers only as regards its flywheel, as has been mentioned. In reality the flywheel is not a flywheel at all, although it performs the functions of one. It is a cleverly wound combination motor-generator, of just the same size as the ordinary flywheel, and, like one, it is enclosed in a housing which forms a unit with the engine crankcase. For engine starting purposes it is automatically converted into a motor by merely pressing a button on the

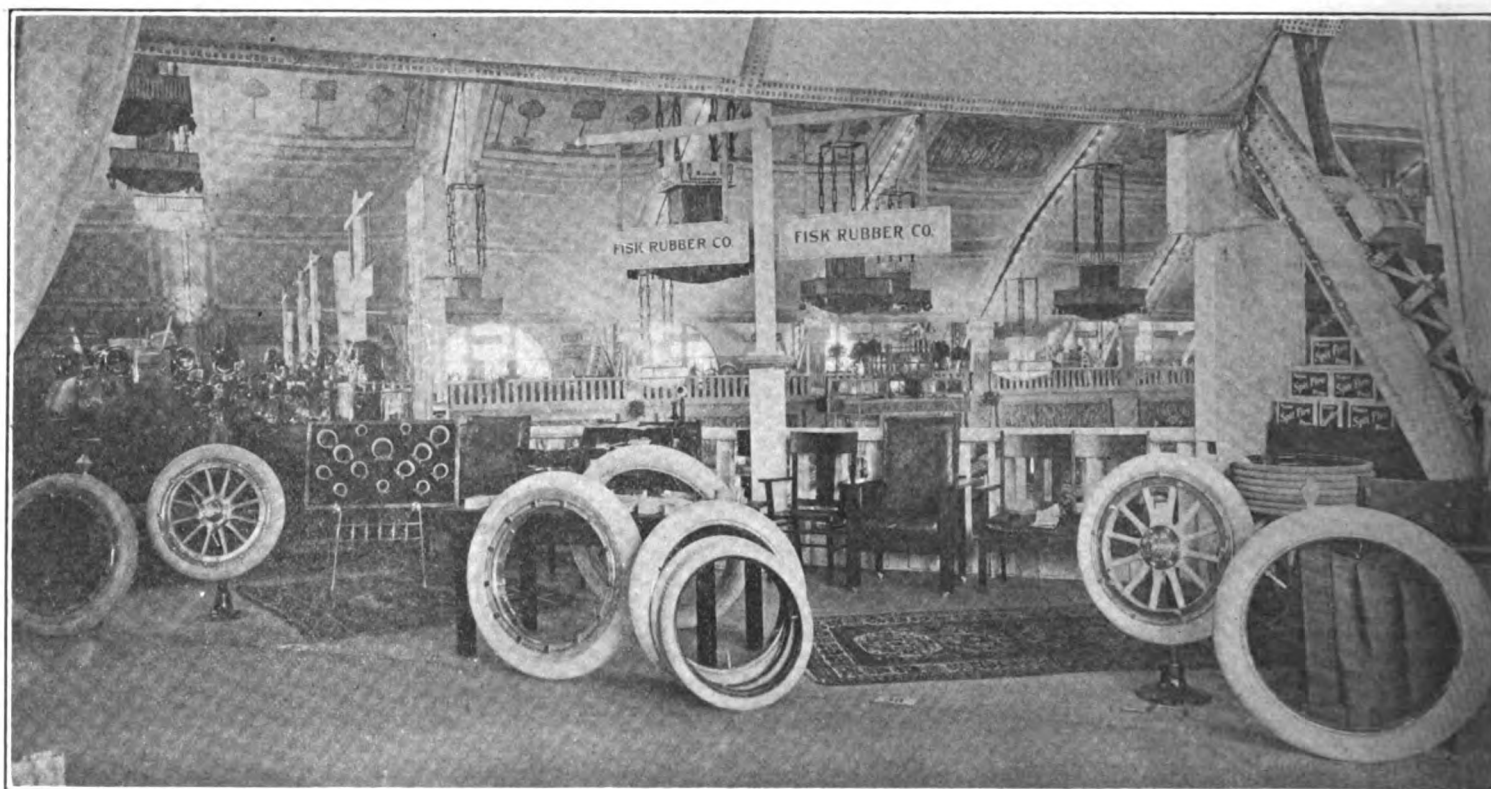
dash, and immediately the engine starts it becomes a generator and takes up its function of maintaining the storage battery charged.

That the Continental line is one which is well-known over the length and breadth of the land is a statement which scarcely requires enlargement or explanation though it probably would surprise quite a few persons to know of the number of different brands of cars for which the Continental motor in one of its many forms has made a reputation. Recently there have been added to the line two new models, both of them "sixes" and though interest naturally centers around the exhibit as a whole, individual interest just as naturally centers around the two new products, not only for the reason that they are new products but also for the reason that they are the first "sixes" to be produced by this veteran manufacturer. In perspective, the two motors—they are furnished either as motors alone or as unit power plants in which case the unit includes multiple disk clutch and three-speed selectively operated change-gear mechanism—are practically identical, both having cylinders cast in threes, and both presenting the same clean cut appearance and carefully worked out design for which Continental motors have become famous. The smaller motor is of the true long-stroke type with cylinders that measure $3\frac{3}{4}$ inches bore and $5\frac{1}{4}$ inches stroke, and the larger one has the same stroke, though the bore is $4\frac{1}{8}$ inches. In both, the cylinders are of the L-head type, as they are in all the Continental motors, this constituting one of the distinguishing features of the line, and in other respects also are quite similar to other members of their immediate family. The lubrication system which is used is common to all the motors and is unique in that it embraces a two-plunger pump which serves to deliver the oil through two leads to the main en-

TWO STUDIES IN THE EFFECTIVE DISPLAY OF TIRES



GOODRICH TIRES AND THE GOODRICH ROOSTER ON THE BALCONY



FISK TIRES INVITINGLY DISPLAYED ON THE COLISEUM BALCONY

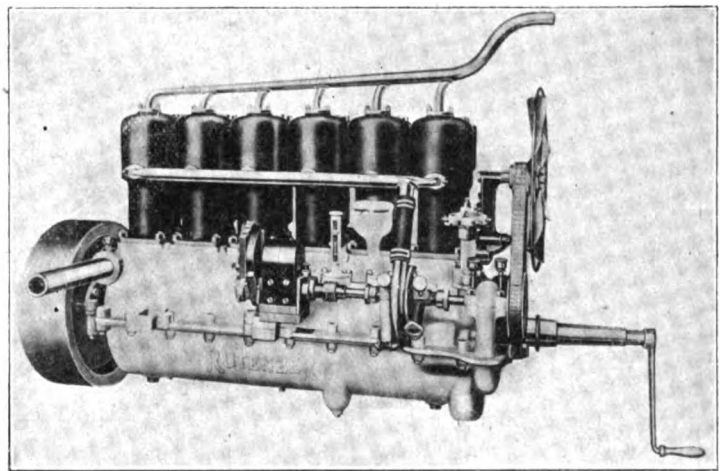
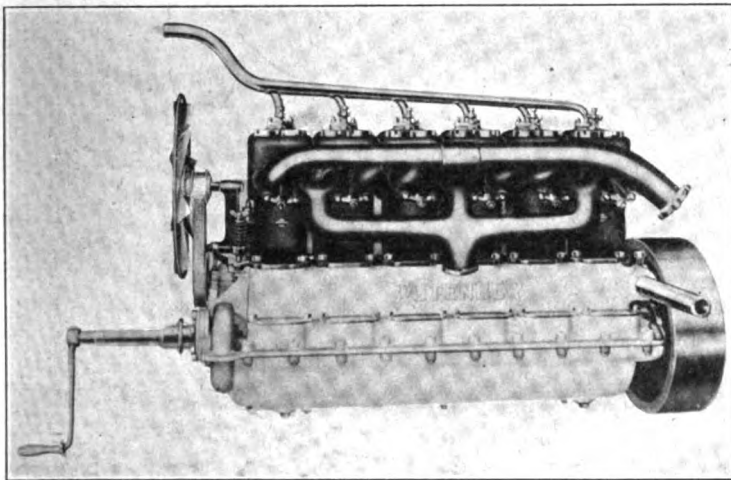
gine bearings and to the timing gear train.

Rutenber is another name which stands for all that is right and proper in the making of automobile motors, and the reputation which these motors have made for their manufacturers, the Western Motor Co., and for any number of brands of pleasure and commercial cars in which they are used is second to none. At the Rutenber exhibit, too, chief interest centers around the latest product of the factories, a six-cylinder model which bears all the earmarks of previous and present Rutenbers. Its most distinctive feature, of course, are its separately cast cylinders which construction is characteristic of all the other motors in the line except one which has its four cylinders cast in a single block, and which like the "six" has but recently been added to the line. Another of the distinctive features of the new "six" which also is common to all the other motors in the line

pairs and the other of block construction. The third also is of block construction, but it is distinctive by reason of the fact that it is the only block motor of the T-head type that is on view. As a matter of fact very few manufacturers build this particular type of motor, though in it are combined the advantages of block construction and oppositely located valves. The motor is rated at 35-40 horsepower and the cylinders measure 4 x 6 inches bore and stroke, respectively. Of the other two types, the larger is rated at 40-45 horsepower and has pair-cast cylinders that measure $4\frac{1}{2}$ x 5 inches, and the smaller has its cylinders cast in a block; the measurements are $4\frac{1}{16}$ x $4\frac{1}{2}$ inches and the rating is 30-35 horsepower. All of the motors are supplied either separately or as unit power plants, in which case the unit includes multiple disk clutch and three-speed selectively operated change gear mechanism.

disconnects the air motor, as a motor, and also converts it into a compressor, by means of which the air tank is maintained charged. Indicative of the strength of the nickel chrome steel which is used in all the motors, one of the largest is exhibited suspended from a piece of the steel turned down to one-tenth of an inch in diameter.

Having attained an enviable reputation by reason of the excellence of its pleasure car motors, the Wisconsin Motor Mfg. Co., Milwaukee, Wis., has enlarged its field of activities by adding to its line a new motor which is especially designed for commercial vehicle work. As such it reflects ruggedness of construction combined with the same fineness of design and clean lines that mark all the other motors in the line, several of which are exhibited both as motors alone and as unit power plants. In common with several of the pleasure car motors in the Wisconsin line, the cylinders of the



NEW RUTENBER "SIX" SHOWING COMPACTNESS OF DESIGN AND METHOD OF SUPPORT

except the new block motor, is the use of a vertical worm driven commutator shaft which also serves to actuate the oil pump through worm gearing at its lower extremity, and the water pump and magneto shafts through other worm gearing. The shaft itself receives its motion from the crankshaft. The new block motor is, of course, radically different from anything that ever has borne the Rutenber nameplate before, if only for the reason that its cylinders are not cast separately. That it rightfully belongs in the long-stroke class is evidenced by the fact that the cylinders measure $3\frac{3}{4}$ inches bore and $5\frac{1}{2}$ inches stroke. Like the other Rutenber motors, the method of driving the magneto and water pump is as unique as it is simple. A single shaft, worm driven from one of the gears in the timing gear train and located transversely to the engine casting at the front operates both, one of them being mounted at end end.

Three types of motors, ranging in power from 30-35 to 40-45, make up the exhibit of the Falls Motor Co., of Sheboygan Falls, Wis. Two of them are of the orthodox L-head type, one with its cylinders cast in

The exhibit of the Waukesha Motor Co., of the Wisconsin city for which the company is named, in addition to including several of the 15-odd different styles which are manufactured, also includes a new type of air-starting motor in unit construction form, which is quite different from anything else that is on the market at the present time. The starter is a combination three-cylinder air pump and air motor attached to the change gear housing and operated through the transmission. Its method of connection is such that a centrifugal governor serves automatically to shift its valves and convert it into a motor or a compressor and also to throw it out of operation as a motor immediately the engine starts. The modus operandi is quite simple; it is merely necessary to depress a button on the dash, when compressed air stored in a tank is admitted to the air motor, which immediately causes the clutch to rotate through the change gear mechanism, the clutch first having been disengaged. When the clutch slowly is let into engagement the motor is started and immediately its speed of rotation reaches a certain predetermined limit the centrifugal governor

truck motor are cast in pairs with the valves on opposite sides; the cylinder dimensions are five inches bore and seven inches stroke. Lubrication is effected by means of a gear driven pump which forces the oil through a hollow crankshaft to the main bearings, sufficient being thrown off to lubricate the cylinders and minor bearings. As becomes a motor intended for the heaviest of service, the bearings and working parts are of exceptional size and strength, the crank shaft, for instance, being of 40 per cent. carbon steel drop forged and afterward heat treated and carefully ground to size.

All of the better-known tire makers and parts makers and lamp makers and other of the important manufacturers who displayed their wares in New York are in evidence in Chicago, but as far as could be discovered the Hayes Manufacturing Co., of Detroit, is the only one which is displaying anything that was not shown at the Madison Square Garden show. It is an all metal touring car body, the first one, it is asserted, that ever has been built. It bears a sign indicating that it is the model adopted for the Hupmobile of 1913. The partic-

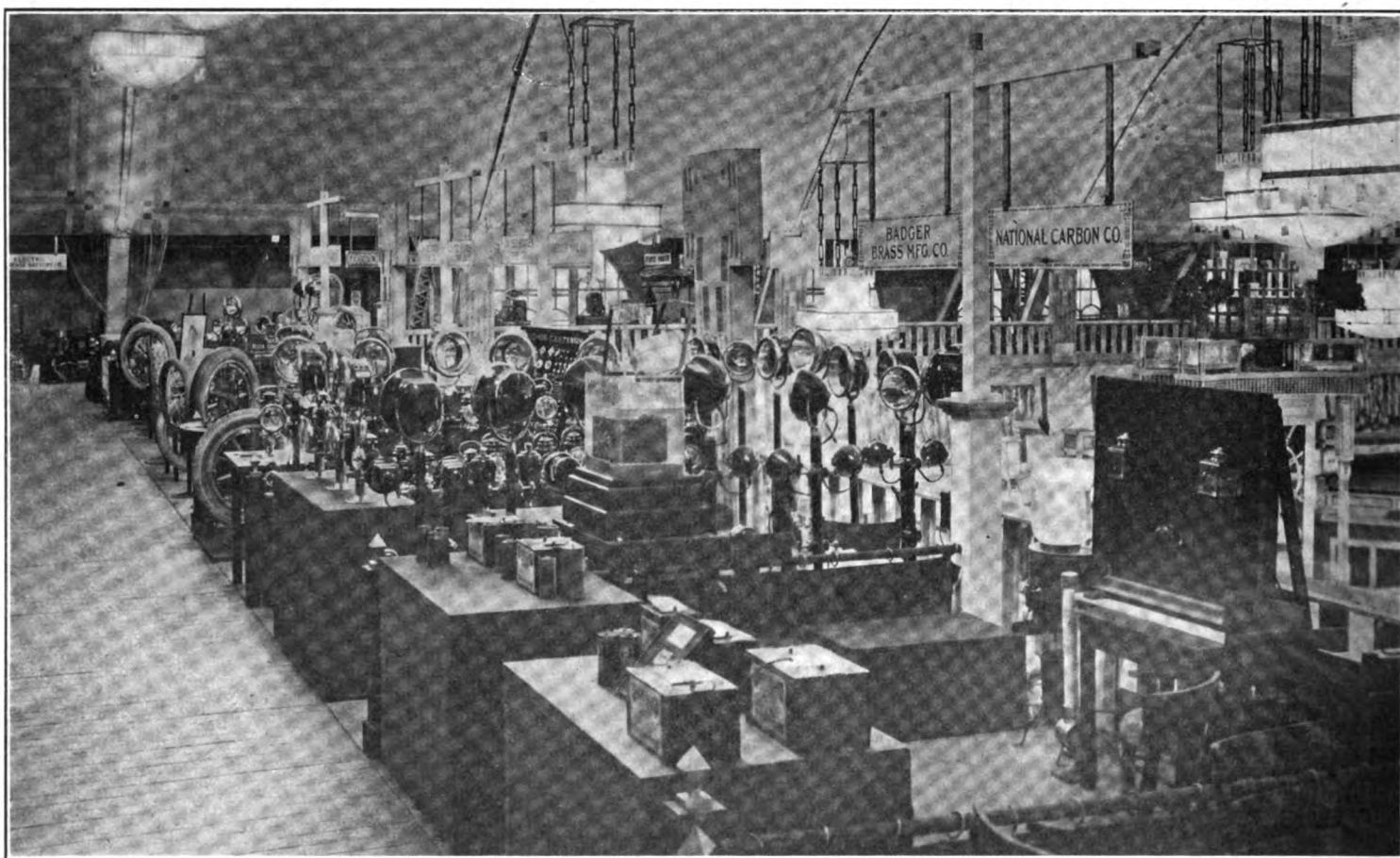
ular Hayes touring car body which was shown in New York, also the Hayes delivery wagon which can be knocked down and shipped 200 to the carload are in evidence, but the new 1913 body is unlike the other Hayes bodies in that it is built around a wood frame. It is metal throughout, including even the floor. The Hayes exhibit includes also the Hayes-Stanwood wood-metal running board and open-work non-slip running board, which drains itself and in which the wood is the same color all through. There also is a one-piece running-board designed for limousines which is provided with a cactus fiber step and in-

Ham company's distinctive "cold blast" principle. In principle and general design the Ham line has undergone no change, but it has been enlarged by the addition of what is styled the Derby side and tail lamps, which are not dissimilar from the other Ham productions, but are of smaller size and designed for use on small cars. They are made for combination use, both oil and acetylene, and oil and electric.

The Imperial Brass Manufacturing Co., of Chicago, as usual displays a large line of brass goods, gasoline, oil and water pumps and gas and water manifolds, priming cups and cocks of all types. The imperial com-

which permits the use of one less ball than the full type. It is also claimed for the United States bearing that there is more stock than usual in the inner and outer rings, and that the raceways are ground deeper.

In addition to its so-called spark plug pump, which can be screwed into the spark plug orifice of the engine and thus permit the automatic inflation of the tires, the Mayo Manufacturing Co., of Chicago, also exhibited a compound tire pump for hand operation, and a tire gauge of the conventional pencil shape, which is remarkable in that it lists at only 50 cents. The Cuta-



ONE OF THE END ROWS OF ACCESSORY EXHIBITS ON THE COLISEUM BALCONY

corporates both a toolbox and a dished depression conforming to the shape of the spare tires.

The Kinsey Manufacturing Co., of Toledo, is another of the notable absentees from New York which is very much in evidence in Chicago. Its productions are varied but of standard pattern. They comprise frames, radiators—one of the cellular type which was added to the line during last year—mudguards, tanks, tool boxes, mufflers, fans, windshields and gaskets, the manufacture of the latter two of which also was embraced by the Kinsey company during the past twelve months.

Of the lamps not seen by New Yorkers there is but one line, that made by the C. T. Ham Mfg. Co., of Rochester, N. Y., which comprises all types and which include the

pany also has added to its productions a carburetter and lubricator, but neither are displayed, although promised for the latter part of the week. The newest of the Imperial specialties is a valve for regulating and reducing the pressure of acetylene lighting and starting systems, the valve being capable of reducing the pressure as low as two ounces. There also is a new Imperial accelerator pedal which shows a segment of a circle arising just above the car floor and which operates with a forward, horizontal motion.

In the matter of bearings but one new one made its appearance, the production of the United States Ball Bearing Manufacturing Co., of Oak Park, Ill. It is made in single and double row types, its chief characteristic being a patented separator

phone, another Mayo production, likewise is included in the display. The device combines both an exhaust whistle and a muffler cutout.

The Barco Brass and Joint Co., another Chicago concern, which limits its displays to the Chicago show, exhibits its Barco three-tone exhaust horns and valves, and also a line of accelerator and locking pedals. The horn is its chief production, however, and it differs from last year's only in that it has been lightened by not less than four pounds by the use of an aluminum webbing and a brass casing.

Among the exhibits of change gear mechanisms, it is doubtful if there is any which is better known or which has a better reputation for all around reliability and efficiency than the Cotta. The distinctive Cot-

ta principle, in which all the gears constantly are in mesh, the different speeds being obtained by means of shifting dog clutches, is retained as a matter of course, though one important change in construc-

tion has been made. This embraces the mounting of the gears that ordinarily run idle when direct drive is used on roller bearings. But even in this point the method of construction is almost as distinctive

as the Cotta principle. The gears themselves, properly hardened, of course, form one of the races and the shafts on which they operate form the other, avoiding the use of a number of extra parts.

Summary of the Accessories Displayed at the Chicago Show

Ajax-Grieb Rubber Co., New York City—Ajax tires.

Allen Auto Specialty Co., New York City—Tire covers, locks and holders.

American Ball Bearing Co., Cleveland, Ohio—Ball bearings and axles.

American Bronze Co., Berwyn, Pa.—Bronze castings.

American Circular Loom Co., Aldene, N. J.—No-lag magneto.

Apple Electric Co., Dayton, Ohio—Aplo ignition and lighting system.

Atlas Chain Co., Brooklyn N. Y.—Atlas tire chains.

Atwater Kent Mfg. Works, Philadelphia, Pa.—Unisparker and Monoplex horn.

Auburn Auto Pump Co., Auburn, N. Y.—Tire pumps and pneumatic jacks.

Automatic Motor & Engineering Co., Chicago, Ill.—Church pneumatic transmission system.

Auto Parts Mfg. Co., Muncie, Ind.—Transmissions and steering gears.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone horns.

Avery Portable Lighting Co., Milwaukee, Wis.—Electrobola lamps.*

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps and generators.

Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains, and Brown steering gears.

Barco Brass & Joint Co., Chicago, Ill.—Exhaust horns, cut-out valves and accelerator and locking pedals.*

Batavia Rubber Co., Batavia, N. Y.—Batavia tires.

Booth Demountable Rim Co., Cleveland, O.—Booth demountable rims.

Bosch Magneto Co., New York City—Bosch magnetos.

Breakstone, S., Chicago, Ill.—Hopewell tire cases and other accessories.*

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos.

Briggs & Stratton Co., Milwaukee, Wis.—B. & S. igniters.

Briscoe Mfg. Co., Detroit, Mich.—Radiators, fenders, hoods and fittings.

Brown Co., Syracuse, N. Y.—Brown tire pumps, lamp lighters and tire racks.

Brown-Lipe Gear Co., Syracuse, N. Y.—Transmissions, differentials and steering gears.

Buda Co., Harvey, Ill.—Motors, gears, forgings and jacks.

Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.

Champion Ignition Co., Flint, Mich.—A-C spark plugs, coils, timers, etc.

Class Journal Co., New York City—Publications.

Chilton Co., Philadelphia, Pa.—Publications.

C. M. B. Wrench Co., Syracuse, N. Y.—Silver King socket wrench.

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, spark coils, magnetos and other ignition specialties.

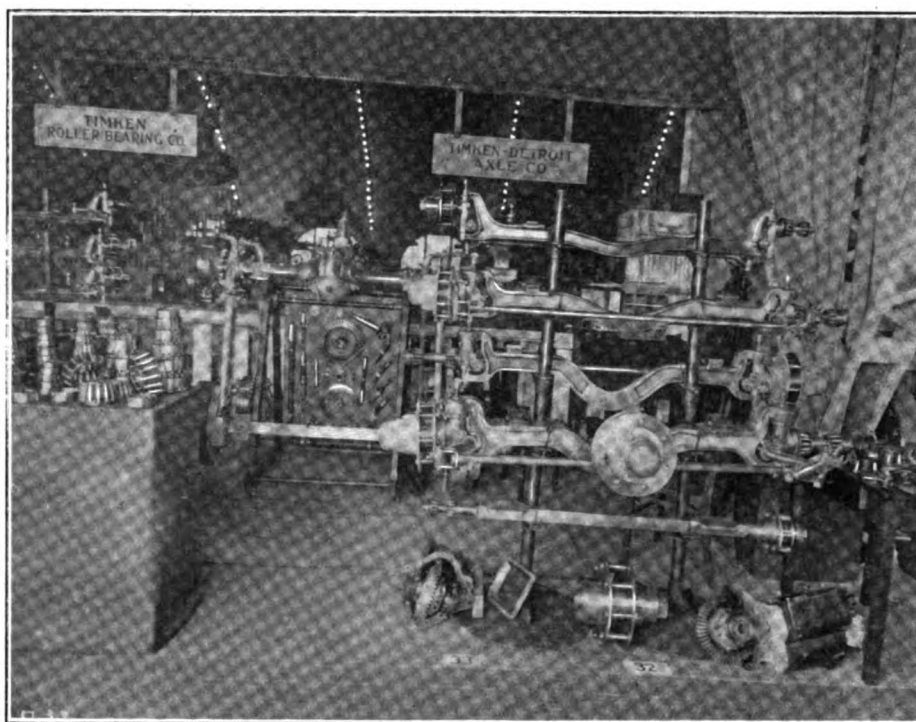
Detroit Lubricator Co., Detroit, Mich.—Lubricators.

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Chains and sprockets.

Diamond Rubber Co., Akron, O.—Diamond tires.

Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.

Dorian Remountable Rim Co., New York City—Dorian remountable rims.



EXHIBITS OF TIMKEN PRODUCTS IN THE COLISEUM

Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.

Continental Motor Mfg. Co., Muskegon, Mich.—Continental motors.*

Continental Rubber Works Co., Erie, Pa.—Inner tubes, patches, etc.

Cook's Sons, Adam, New York City—Lubricants.

Cotta Transmission Co., Rockford, Ill.—Transmissions.*

Cowles & Co., C., New Haven, Conn.—Forgings, mountings, and trimmings.

Cramp & Sons Ship and E. B. Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.

Dean Electric Co., Elyria, O.—Tuto horns and Dynalux lighting systems.

Detroit Electric Appliance Co., Detroit, Mich.—Delco electric lighting apparatus and engine starters.

Dover Stamping & Mfg. Co., Cambridge, Mass.—Drip pans and funnels.

Double-Fabric Tire Co., Auburn, Ind.—Tires and inner tubes.

Driggs-Seabury Ordnance Corp., Sharon, Pa.—Frames, transmissions, crank shafts, etc.

Eagle Co., Newark, N. J.—Windshields.

Edelmann & Co., E., Chicago, Ill.—Tire gauges, oil gauges, hydrometers and twin screw drivers.*

Edison Storage Battery Co., Orange, N. J.—Storage batteries.

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Eisemann Magneto Co., New York City—Eisemann magnetos.

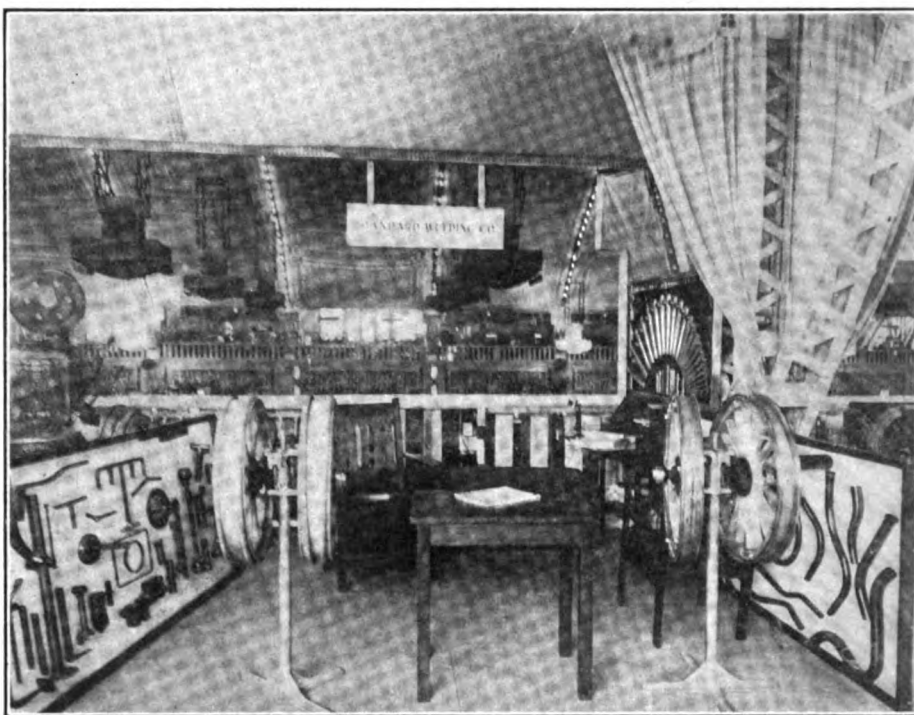
Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.

Empire Tire Co., Trenton, N. J.—Empire tires, inner tubes, etc.

Esterline Co., Lafayette, Ind.—Matchless electric lighting and ignition system.
 Falls Machine Co., Sheboygan Falls, Wis.—Falls motors.*
 Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.
 Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.
 Firestone Tire & Rubber Co., Akron, O.—Firestone tires and rims.
 Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires and rims.
 Gabriel Horn Mfg. Co., Cleveland, O.—Gabriel exhaust horns and rebound snubbers.
 Gemmer Mfg. Co., Detroit, Mich.—Steering gears and parts.
 General Electric Co., Schenectady, N. Y.—Charging sets and lighting switches.
 Globe Machine & Stamping Co., Cleveland, O.—Steel boxes for tools.
 Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
 Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.
 Gray & Davis, Amesbury, Mass.—Lamps and electric lighting system.
 Gray-Hawley Mfg. Co., Detroit, Mich.—Exhaust horns and mufflers.
 Ham Mfg. Co., C. T., Rochester, N. Y.—Lamps.*
 Harris Oil Co., A. W., Providence, R. I.—Lubricants.
 Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, engine starters and jacks.
 Havoline Oil Co., New York City—Lubricants.
 Hayes Mfg. Co., Detroit, Mich.—Metal bodies, tool boxes and running boards.
 Hayes Wheel Co., Jackson, Mich.—Wood wheels.*
 Heinze Electric Co., Lowell, Mass.—Magnets and coils.
 Herz & Co., New York City—Herz magnets.
 Hess Spring & Axle Co., Cincinnati, O.—Hess axles and springs.
 Hoffnung & Co., Ltd., S., New York City—Coventry chains and "Fastnut" lock washers.
 Horseless Age Co., New York City—Publications.
 Imperial Brass Mfg. Co., Chicago, Ill.—Carburetters, lubricators, manifolds, tire pumps, valves and cocks.
 International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.
 International Metal Polish Co., Indianapolis, Ind.—Blue Ribbon metal polish.
 Jackson-Church-Wilcox Co., Saginaw, Mich.—Transmissions and parts.
 Johnson & Co., Isaac G., Spuyten Duyvil, N. Y.—Forgings and castings.
 Jones Speedometer, New Rochelle, N. Y.—Jones speedometers, odometers and recorders.
 Kellogg Mfg. Co., Rochester, N. Y.—Kellogg hand and power air pumps.

Keystone Lubricating Co., Philadelphia, Pa.—Keystone oils and greases.
 K-W Ignition Co., Cleveland, Ohio—K-W ignition devices.
 Kinsey Mfg. Co., Toledo, Ohio—Frames, radiators, fans, tanks, windshields and other fittings.*
 Kokomo Electric Co., Kokomo, Ind.—Kingston coils and timers.
 Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads.
 Lee Tire & Rubber Co., Conshohocken, Pa.—Jelco-Atlas puncture-proof tires and tubes.
 Lefever Arms Co., Syracuse, N. Y.—Transmissions.

Mossberg Co., Frank, Attleboro, Mass.—Wrenches and bells.
 Motor, New York City—Publications.
 Motor World Publishing Co., New York City—The Motor World.
 Motz Clincher Tire & Rubber Co., Akron, O.—Motz cushion tires.
 Muncie Gear Works, Muncie, Ind.—Wheels, gears, etc.
 National Carbon Co., Cleveland, O.—Dry cells.
 National Coil Co., Lansing, Mich.—Spark coils.
 National Motor Supply Co., Cleveland, O.—Supplies.



STANDARD WELDING CO.'S GOODS EFFECTIVELY DISPLAYED

Leland & Co., W. H., Worcester, Mass.—Machinery.*
 Link Belt Co., Indianapolis, Ind.—Chains.
 Longdin-Brugger Co., Fond du Lac, Wis.—Automobile tops.*
 Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns, Conover bumpers and Raiswell jacks.
 McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and gaskets.
 McCue Co., Buffalo, N. Y.—Axles and wire wheels.
 Martel Blowout Protector Co., Chicago, Ill.—Emergency tire sleeves.*
 Mayo Mfg. Co., Chicago, Ill.—Automatic tire pumps, tire gauges, etc.*
 Michelin Tire Co., Milltown, N. J.—Michelin tires.*
 Model Gas Engine Co., Peru, Ind.—Motors, transmissions, clutches.*
 Morrison-Ricker Mfg. Co., Grinnell, Ia.—Grinnell gloves.
 Mosler & Co., A. R., New York City—Spit-Fire spark plugs.

National Rubber Co., St. Louis, Mo.—Rubber preservatives.
 National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
 New York & New Jersey Lubricants Co., New York City—Columbia lubricants.
 Northway Motor & Mfg. Co., Detroit, Mich.—Motors and unit power plants.
 Norton Grinding Co., Worcester, Mass.—Abrasive materials.*
 Oliver Mfg. Co., Chicago, Ill.—Peerless jacks.
 Pantasote Co., New York City—Top and upholstering materials.
 Peck Wheel Co., Chicago, Ill.—Spring wheels.
 Pennsylvania Rubber Co., Jeanette, Pa.—Pennsylvania and Polack tires.
 Perfection Spring Co., Cleveland, O.—Perfection automobile springs.
 Perfect Window Regulator Co., New York City—Window regulating devices.
 Piel Co., G., Long Island City, N. Y.—Long horns.
 Pittsfield Spark Coil Co., Dalton, Mass.—

- Pittsfield magnetos, Jewel plugs and other ignition devices.
- Randall-Faichney Co., Boston, Mass.—Jericho exhaust horns, B-line grease guns, etc.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and electric lighting systems.
- Republic Rubber Co., Youngstown, O.—Republic tires.
- Rhineland Machine Works, New York City—Ball bearings.
- Ross Gear & Tool Co., Lafayette, Ind.—Steering gears.
- Royal Equipment Co., Bridgeport, Conn.—Band brakes, Raybestos brake lining materials and Gyrex gasoline mixer.
- Sager Co., J. H., Rochester, N. Y.—Sager bumpers, shock absorbers and supplementary springs.
- Selbach Rubber Co., Boston, Mass.—Tire protectors and sleeves.
- Shaler Co., C. A., Waupun, Wis.—Steam and electric vulcanizers.
- Shawmut Tire Co., Boston, Mass.—Shawmut tires.
- Sheldon Axle Co., Wilkes-Barre, Pa.—Axles and springs.
- Smith Co., A. O., Milwaukee, Wis.—Frames and parts.
- Spacke Machine Co., F. W., Indianapolis, Ind.—Gear wheels, piston-rings and motorcycle engines.
- Sparks-Withington Co., Jackson, Mich.—Fans, stampings and screw machine products.
- Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.
- Splitdorf, C. F., New York City—Splitdorf magnetos and spark plugs.
- Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.
- Standard Thermometer Co., Boston, Mass.—Standard speedometers.
- Standard Varnish Works, Chicago, Ill.—Varnishes.
- Standard Welding Co., Cleveland, O.—Electrically welded rims, tubing and parts.
- Start-Lite Co., Chicago, Ill.—Lamp lighting and engine-starting systems.
- Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.
- Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetors.
- Stutz Auto Parts Co., Indianapolis, Ind.—Parts.
- Swinehart Tire & Rubber Co., Akron, O.—Swinehart tires.
- Texas Co., New York City—Lubricants.
- Timken Detroit Axle Co., Detroit, Mich.—Axles.
- Timken Roller Bearing Co., Canton, O.—Roller bearings.
- Tingley, Charles O., Rahway, N. J.—Tire patches and vulcanizing outfits.
- Troy Carriage Sunshade Co., Troy, O.—Windshields and tops.
- Turner Brass Works, Sycamore, Ill.—Portable brazing apparatus and tire pumps.
- United Rim Co., Akron, O.—Standard Universal rims.
- United States Ball Bearing Co., Oak Park, Ill.—Ball bearings.*
- United States Light and Heat Co., New York City—Storage batteries.
- United States Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.
- Universal Tire Protector Co., Angola, Ind.—Tire protectors.
- Universal Wind Shield Co., Chicago, Ill.—Windshields.
- Valentine & Co., New York City—Varnishes.
- Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers and odometers.
- Vesta Accumulator Co., Chicago, Ill.—Vesta lamps, generators and accumulators.
- Voorhees Rubber Mfg. Co., Jersey City, N. J.—Inner tubes and patches.
- Warner Gear Co., Muncie, Ind.—Transmissions, steering gears, levers, etc.
- Warner Instrument Co., Beloit, Wis.—Warner autometers.
- Warner Mfg. Co., Toledo, O.—Transmissions, unit power plants, and steering gears.
- Waukesha Motor Co., Waukesha, Wis.—Motors.*
- Weed Chain Tire Grip Co., New York City—Weed tire chains.
- Western Motor Co., Marion, Ind.—Rutember motors.*
- Weston-Mott Co., Flint, Mich.—Transmissions and axles.
- Western Tool and Forge Co., Brackenridge, Pa.—Forgings and tools.
- Wheeler & Schebler Co., Indianapolis, Ind.—Schebler carburetors and magnetos.
- Whitney Mfg. Co., Hartford, Conn.—Whitney chains.
- Willard Storage Battery Co., Cleveland, O.—Elba lighting outfits.
- Williams & Co., J. H., Brooklyn, N. Y.—Forgings and tools.
- Wisconsin Motor Mfg. Co., Milwaukee, Wis.—Motors.*
- Wolverine Lubricants Co., New York City—Lubricants.

Immense Fleet of Trucks That Will Follow the Cars in Chicago

Just as the truck show in Madison Square Garden followed upon the heels of the pleasure car show, so the eleventh M. A. A. M. exhibition in Chicago will devote the last half of its two weeks' run to a display of vehicles of the "working class"—with the collection of accessories that is inseparable from any motor vehicle show. In many ways the show will be "bigger and better than ever," for it will have no less than 78 exhibitors of cars—more than the combined exhibits of the Garden and the Palace truck shows—as against 51 presented at the last Chicago show; and of these no less than 32 will be exhibitors who were not in evidence in New York, or who will have different exhibits.

One of the most notable additions to the list of exhibitors of commercial vehicles will be the A. O. Smith Co., long known as makers of parts, and for the first time entering the field with a complete truck which in the vernacular should be "some truck," if experience in the manufacture of components goes for anything. A number of concerns, either new or exhibiting motor

trucks for the first time, will add much to the interest in the show. The National Motor Truck Co., which is under the same management as the National Cycle & Mfg. Co., will exhibit the Natco truck; the Harder Auto Truck Co., building the Harder truck was formerly Harder's Fireproof Storage & Van Co., and exhibited at Chicago's last show under that name; the Harwood-Barley Co. will show Indiana trucks; Henry Lee Power Co., Old Reliable trucks; the Dorris Motor Car Co., hitherto known as manufacturer of pleasure cars, will show Dorris commercials; the Premier Motor Mfg. Co., likewise the Staver Carriage Co., are other concerns that have built pleasure cars that for the first time will stage "commercials;" and the list also includes the Bessemer Motor Truck Co., Bessemer trucks; Diamond T Motor Car Co., Diamond T trucks; Mogul Motor Truck Co., Mogul trucks, Sandusky Auto Parts & Motor Truck Co., Sandusky trucks; Blair Mfg. Co.; Joseph Dain; Law Motor Truck Co.; Service Motr Car Co., and the M. & P. Electric Vehicle Co.

Of course there will be plenty of the old familiar cars there—the Sampson, and the Alco, the General Vehicle cars, Knox, White, Packard, Lansden, Waverley and the rest of them—without which no commercial vehicle show would be complete. There will be nothing like an international flavor, for foreign trucks will be "absent in large numbers"—in fact, so far as advance information indicates, there will be no European built cars, and only two—the Saurer and the Commer—which originated out of "these United States," but now are built in this country.

One of the things the N. A. A. M. is going to do, and do in the most approved style, is to take care of the agents who represent the various manufacturers exhibiting at the show. Every one of these agents—something like 5,000 in all—have been sent special invitations to attend the show, and the invitations have been accompanied by coupons that are convertible into passes good as long as the show lasts. And even those who, for any reason, fail to receive their invitations will not have to kick

their heels outside the doors, or pay their way in, either, for they will be "season passed" as soon as they identify themselves properly.

Following is a full list of intending exhibitors and their space numbers:

Adams Bros. Co., Findlay, Ohio (N3)—Adams.*

Alden-Sampson Mfg. Co., Detroit, Mich. (P1)—Sampson.

American Locomotive Co., New York City (E1)—Alco.

Atterbury Motor Car Co., Buffalo, N. Y. (P2)—Atterbury.

Autocar Co., Ardmore, Pa. (M1)—Autocar.

Avery Co., Peoria, Ill. (C2)—Avery.*

Bessemer Motor Truck Co., Grove City, Pa. (F3 Armory)—Bessemer.*

Blair Mfg. Co., Newark, Ohio (E5 Armory)—Blair.*

Bowling Green Motor Car Co., Bowling Green, Ohio (D4 Armory)—Modern.

Brush Runabout Co., Detroit, Mich. (D4)—Brush.

Buick Motor Co., Flint, Mich. (R)—Buick.

Cartercar Co., Pontiac, Mich. (C5)—Cartercar.

Chase Motor Car Co., Syracuse, N. Y. (G5 Armory)—Chase.

Chicago Pneumatic Tool Co., Chicago, Ill. (C4 Armory)—Little Giant.*

Clark Delivery Car Co., Grand Crossing, Chicago (M2)—Clark.*

Commerce Motor Car Co., Detroit, Mich. (F2 Armory)—Commerce.

Dain, Joseph, Ottumwa, Iowa (B3 Armory)—*.

Dart Mfg. Co., Waterloo, Ia. (A3)—Dart.

Dayton Auto Truck Co., Dayton, Ohio (Q3)—Dayton.

Diamond T Motor Car Co., Chicago, Ill. (G4 Armory)—Diamond T.*

Dorris Motor Car Co., St. Louis, Mo. (Q4)—Dorris.*

Durant-Dort Carriage Co., Flint, Mich. (Q1)—Best.

Federal Motor Truck Co., Detroit, Mich. (N2)—Federal.

Garford Co., Elyria, Ohio (D1)—Garford.

General Motors Truck Co., Detroit, Mich. (B1, G. H)—G. M. C.

Grabowsky Power Wagon Co., Detroit, Mich. (B4)—Grabowsky.

Gramm Motor Truck Co., Lima, Ohio (D6)—Gramm.

Harder Auto Truck Co., Chicago, Ill. (O)—Harder.*

Harwood-Barley Mfg. Co., Marion, Ind. (D3 Armory)—Indiana.*

International Harvester Co., of America, Chicago, Ill. (G1 Armory)—I. H. C.*

International Motor Co., New York City (A4)—Saurer and Mack.

Jeffery Co., Thomas B., Kenosha, Wis. (A1)—Rambler.

Kelly Motor Truck Co., Lima, Ohio (B3)—Kelly.

Kissel Motor Car Co., Hartford, Wis. (F1)—Kissel.*

Knox Automobile Co., Springfield, Mass. (D5)—Knox.

Lauth-Juergens Motor Car Co., Freemont, Ohio (B4)—Lauth-Juergens.

Law Motor Truck Co., Findlay, Ohio (E5 Armory)—*.

Lee Power Co., Henry, Chicago, Ill. (C2 Armory)—Old Reliable.*

Locomobile Co., of America, Bridgeport, Conn. (C4)—Locomobile.

Lozier Motor Co., Detroit, Mich. (K)—Lozier.

McIntyre Co., W. H., Auburn, Ind. (L)—McIntyre.

Mercury Mfg. Co., Chicago, Ill. (D6)—Mercury.*

Mogul Motor Truck Co., Chicago, Ill. (D2 Armory)—Mogul.*

Monitor Motor Works, Janesville, Wis. (G3 Armory)—Monitor.*

Motor Wagon Co., of Detroit, Mich. (C3 Armory)—Detroit.

National Motor Truck Co., Bay City. (D1 Armory)—National.*

Packard Motor Car Co., Detroit, Mich. (C1)—Packard.

Packers Motor Truck Co., Wheeling, W. Va. (B5 Armory)—Packers.

Peerless Motor Car Co., Cleveland, Ohio (D2)—Peerless.

Pierce-Arrow Motor Co., Buffalo, N. Y. (F2)—Pierce-Arrow.

Pope Mfg. Co., Hartford, Conn. (B5)—Pope.

Poss Motor Co., Detroit, Mich. (E4 Armory)—Poss.

Premier Motor Mfg. Co., Indianapolis, Ind. (N1)—Premier.*

Reo Motor Car Co., Lansing, Mich. (B2)—Reo.

Sandusky Auto Parts and Motor Truck Co., Sandusky, Ohio (B1 Armory)—*.

Sanford-Herbert Co., Syracuse, N. Y. (B2 Armory)—Sanbert.

Schacht Motor Car Co., Cincinnati, Ohio (F1 Armory)—Schacht.

Schmidt Bros., Chicago, Ill. (E3)—Schmidt.*

Service Motor Car Co., Wabash, Ind. (G2 Armory)—Service.*

Smith Co., A. O., Milwaukee, Wis. (B6 Armory)—Smith.*

Speedwell Motor Car Co., Dayton, Ohio (E1 Armory)—Speedwell.

Staver Carriage Co., Chicago, Ill. (J)—Staver.*

Stearns Co., F. B., Cleveland, Ohio (C3)—Stearns.

Stegeman Motor Car Co., Milwaukee, Wis. (A4 Armory)—Stegeman.*

Stephenson Motor Car Co., Milwaukee, Wis. (A2)—Stephenson.*

Sternberg Mfg. Co., Milwaukee, Wis. (C1 Armory)—Sternberg.*

U. S. Motor Truck Co., Cincinnati, Ohio (Q2)—U. S.

Velie Motor Vehicle Co., Moline, Ill. (E2 Armory)—Velie.

White Co., Cleveland, Ohio (A3)—White.

Whitesides Commercial Car Co., New Castle, Ind. (E3 Armory)—Whitesides.*

Wilcox Motor Car Co., H. E., Minneapolis, Minn. (E3 Armory)—Wilcox.*

Wyckoff, Church & Partridge, Inc., New York City (A1, A3 Armory)—Commer.

Electric Commercial Vehicles.

Anderson Electric Car Co., Detroit, Mich. (E2)—Detroit.

Baker Motor Vehicle Co., Cleveland, Ohio (A2)—Baker.

General Vehicle Co., Long Island City, N. Y. (S)—General Vehicle.

Lansden Co., Newark, Ohio (E6 Armory)—Lansden.

M. & P. Electric Vehicle Co., Detroit, Mich. (E3 Armory)—*.

Walker Vehicle Co., Chicago, Ill. (A2 Armory)—Walker.

Waverley Co., Indianapolis, Ind. (C6)—Waverley.

"Scranton March" for Scranton Show.

In view of the fact that the average Scrantonian is 99 per cent. loyal to anything that smacks of local enterprise, it is hardly necessary to state that when, on Monday evening the 29th ult., at 8 o'clock sharp, the doors of the Thirteenth Pennsylvania Regiment Armory were opened on the Scranton Automobile Dealer's Association's second annual automobile show, there drifted from the East end of the drill hall the strains of a truly, and not strange to say, local tune—the "Scranton March." Consistent with this feeling of loyalty, it may be added that of the 22 exhibitors who are displaying pleasure or commercial vehicles, 17 are local dealers. In the accessories 12 of the 15 are local men.

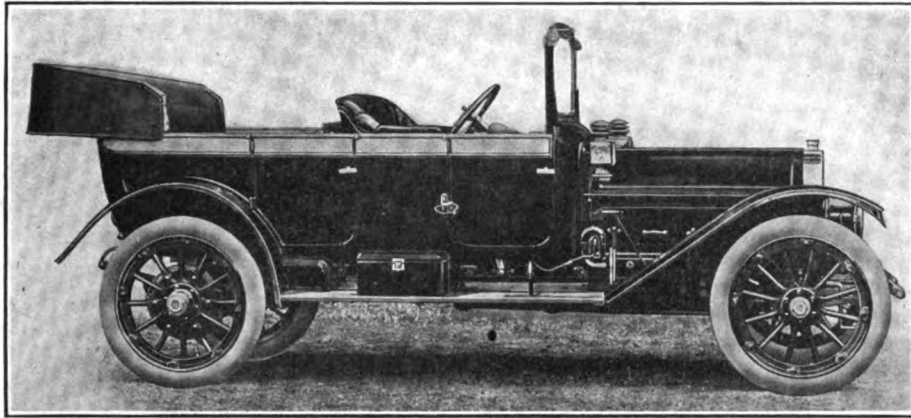
The decorations are simple, yet effective. Entering the drill hall the visitor gazes on thousands of feet of banners and streamers, hanging from the ceiling, fairly hiding all the girders and beams. From end to end, and side to side are festooned colored electric light bulbs, all subordinated by an enormous electric star which hangs directly over the center of the room. Below the star, and at a distance of about 15 feet from the floor, hangs a Curtiss biplane suspended from the ceiling girders by wire cables. The show will continue until Saturday, 4th inst.

Among the exhibitors are: Anthracite Motor Car Co., Peter Beyrent, Conrad Bros. Co., Penn Automobile Co., Stoddard-Dayton Co., Giles Ely, Challenger Bros., American Locomotive Co., Wyoming Motor Car Co., John H. Fleming, A. M. Baker, Jr., Susquehanna Motor Car Co., C. B. Scott Co., A. J. Schnell, P. J. Needham, Economy Automobile Co., R. A. Ammerman, Rambler Automobile Co., Bishop Bros., Lackawanna Automobile Co., Eureka Motor Car Co., H. Spencer, who exhibit motor vehicles, and Standard Motor Car Co., C. A. Ritzman, M. R. Zehnder, Atlantic Refining Co., Gibney & Bros., Wayne Oil Tank & Pump Co., Conrad Bros., Scranton Electric Construction Co., Motorcycle Sales Co., C. B. Scott Co., John Rawling, Lackawanna Vulcanizing Co., Aetna Life Insurance Co., Meyer Bros., Tiona Oil Co., who occupy "Accessory" row.

CAR THAT SERVES TWO PURPOSES

Stevens-Duryea Adds Convertible Phaeton to Its Line—Ingenious Construction That Permits of Convertibility.

While it is possible to motor in comfort all the year round by using an open touring car for fine weather and a limousine when the skies are not in kindly mood, it has not been possible, until quite recently,



STEVENS-DURYEY CONVERTIBLE PHAETON AS AN OPEN CAR

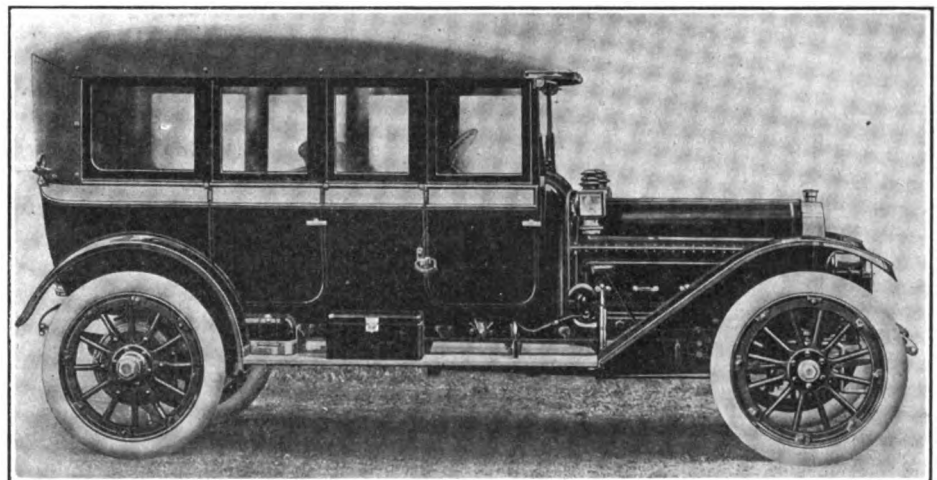
to combine the advantages of both types of vehicle in a single car. The problems involved in the production of such a car were so difficult of solution that no little time and skill were required in order to bring out a machine that would satisfactorily fill the proverbial "long felt want." A convertible touring car-limousine must possess the appearance of an ordinary touring car, without conspicuous "attachments" and extra parts when used as an open car, and it must have the essential comforts of a limousine when enclosed. It must be easily and quickly converted as occasion may demand, and withal its weight must not be excessive.

A very handsome body of this type is one of the "jobs" in which the Stevens-Duryea Co., of Chicopee Falls, Minn., takes particular pride. This is of such recent design that it was staged at neither the New York nor Chicago shows, although displayed in the company's showroom. The car is of the closed front touring type with a top which when folded has the appearance of an ordinary touring car top. There is nothing on the machine to indicate to the casual observer its dual character. Concealed and protected by flaps inside the four doors, however, are glass windows, and in a compartment at the back of the front seat are four more windows. When weather conditions make the enclosure of the body desirable, the top is extended until it meets the glass windshield in front of the driver's seat, the flaps of the four doors are unbuttoned and the glass windows raised to a vertical position, where they are securely held by spring fastenings; and the glass windows are taken from their box and put in place, one on each side of the rear seat,

and one on each side of the driver's seat, two thumbscrews holding each window securely and preventing rattling. The supports for the top are vertical, and are so placed that they form the jambs for the windows. The result is an enclosed car with the clear outlook afforded by a conventional limousine and the same protection against the elements. The glass front is in a single piece and is hung on pivots at the top, so that it can be swung inward at the bottom to admit air. A snow scraper

is provided to keep the glass clear in blizzard weather.

Great care has been taken to avoid unnecessary weight, the Stevens-Duryea company stating that the convertible phaeton weighs only 50 to 75 pounds more than a standard touring car of the same size. The



THE SAME BODY CONVERTED INTO A FULLY ENCLOSED ONE

same degree of care has been exercised to prevent all rattling, and joints that are liable to wear are provided with adjusting nuts that can be taken up with a wrench and all looseness eliminated. It is intended that the car shall be suitable for long distance touring, and with this in view the seats have been made extremely comfortable. The upholstery is deep and soft, and the fronts of the seats are raised so that the passenger is tipped backward into a comfortable position. This type of seat is particularly restful on extended trips.

While the change effected by raising the top and putting the windows in position completely alters the appearance and character of the car, it is not a lengthy or a difficult process. In fact, the time required is less than is needed to put up the ordinary touring car top, attach the side curtains and button them down.

Non-Skid Device For Heavy Duty.

Everything about a motor truck should be just as strong and as simple as it is possible to make it, and the tire chains or other road-gripping devices are no exception to the rule. This idea of simplicity and strength is well carried out in the Corbin non-skid device, manufactured by the Corbin Truck Parts Co., of Kingston, N. Y. The Corbin non-skid is made only for dual tires, either solid or pneumatic, and consists of a series of cross-bars connected together by a chain; the chain encircles the wheel between the two tires and is provided with connecting links at three points, so that it can be separated into three sections to facilitate easy handling. The cross-bars have wedge-shaped projections which fit between the tires, so that they are closely held while the weight of the car is on them. One of the advantages of this chain is that it is not necessary to stretch it tightly on the wheel; it is attached loosely, and can creep somewhat so that the wear of the crossbars is distributed. If a chain breaks it cannot catch in the brake gear or chain, but merely falls on the ground—a matter of no small impor-

tance. A grade of steel having a high tensile strength is used, and it

Windshield Glass That is Dangerous.

If it becomes necessary to replace the glass in a windshield, it is false economy—or rather not economy at all—to use anything but heavy glass, at least as heavy as the original. Thin glass will not withstand the vibration, and its breakage may cause more or less serious personal injury, to say nothing of the added expense of frequent renewals.

PITTSBURGH SHOW RIVALRY BEGINS

First of Smoky City's "Double Bill". Opens Its Doors—Attractive Decorations and Many Exhibits in Evidence.

Pittsburgh, which is one of the cities that will be "blessed" by the staging of two automobile shows, welcomed the first one when the doors of Duquesne Garden opened at 8 o'clock on Saturday last, 27th ult. It was the sixth annual show of the Pittsburgh Automobile Dealers' Association. The other show, which will be held in the Exposition building during the week beginning February 17th will be conducted by the Pittsburgh Automobile Show association.

The exterior of Duquesne Garden, lighted as it is with nearly one hundred arc lamps and decorated with gaily colored banners and entwined streamers, the latter of which extend across the street in front of the main entrance, presents quite a contrast to the usual run of show decorations wherein the entire efforts of the decorators are confined to the production of a pleasing interior. Bright, as is the outside of the garden, however, the inside is much brighter, and more ornate, for to the banners and streamers which do much toward making the outside attractive, is added in the interior decorative scheme a trellis work laden with scarlet poinsettias and southern smilax, which completely cover the walls and ceiling. Three mammoth sunbursts grace the center of the ceiling, while the aisles are adorned with row after row of illuminated arches.

Among the 35 different makes of motor cars exhibited by 28 dealers or manufacturers, but one make which is new, in that it has not been heretofore exhibited, is in evidence. This is the Pilot, a four-cylinder machine produced in various body styles, on two stock chassis, a 30-36 and a 40-45, by the Pilot Motor Car Co., Richmond, Ind., which is staged by N. C. Morrison & Co. New in the accessories department is the product of the Seeroad Lamp Swivel Co., which exhibits an automatic swiveling lamp and bracket arranged so as to direct the rays of the front lamps according to the angle of the steering wheel, considerably reducing the dangers of night travel on tortuous roads.

The show will continue until Saturday, February 3—when it will be superseded by the commercial vehicle show, which will constitute Part II of the Dealers' Association's effort.

Among the exhibitors are: Abbott-Detroit Motor Car Co., Abbott-Detroit; Eddie Bald Motor Car Co., Everitt; Baker Electric Sales Agency, Baker Electric; W. W. Bennett Motor Car Co., Pope Hartford; Buick Motor Co., Buick; East End Auto Co., Waverley Electric; Ford Motor Co., Ford; Franklin Auto Co., Franklin; J. E. Graham Co., Reo and Kissel; Hiland Au-

tomobile Co., Peerless; Keystone Automobile Co., Stoddard-Dayton; McAllister Bros. Motor Car Co., Cadillac; McCurdy-May Co., Pierce-Arrow; N. C. Morrison Co., Pilot; A. X. Phelan, Lozier; J. M. Quimby Co., Simplex; Pioneer Motor Car Co., American and Hudson; Pittsburgh Chalmers Co., Chalmers; Pittsburgh Mercer Co., Mitchell and Mercer; Poffinberger Motor Car Co., Marmon and Amplex; Premier Motor Co., Premier; Robinson Painter Co., Garford and Overland; F. B. Stearns Co., Stearns; Standard Automobile Co., Packard; United Motor Pittsburgh Co., Sampson, Maxwell and Columbia; Vesta Motor Car Co., Stevens-Duryea; The White Co., White; Winton Motor Car Co., Winton; R. & L. Electric Sales Co., Rauch & Lang; Schacht Motor Car Co., Schacht.

The 30 accessories exhibitors are as follows: Atlantic Refining Co., lubricants. Auto Tire Co., tires; Automobile; Automobile Journal; Banker Wind Shield Co., windshields; W. G. Bratton, speedometers; Chamberlain Mfg. Co., Desolvo metal polish; Eyler & Henry, automobile insurance; E. J. Flentje, shock absorbers; Hipwell Mfg. Co., automobile horns; Hoover & Hurst, insurance; Iron City Spring Co., springs; Jackson Motor Supply Co., accessories; A. E. Kent Co., insurance; Mutual Wind Shield Co., windshields; Motor Age; McGraw Tire and Rubber Co., tires; Penn Automobile Specialties Co., accessories; Pittsburgh Lamp and Repair Co., radiators and lamps; Pittsburgh Auto Equipment Co., accessories; Pyrene Sales Co., fire extinguishers; Standard Automobile Co., accessories; Seeroad Lamp Swivel Co., swivel bracket lamps; Universal Appliance Co., mirrors; Wayne Oil Tank and Pump Co., tanks and pumps; Winterton Mfg. Co., windshields; Joseph Woodwell Co., accessories; Union Auto Specialties Co., windshields.

Wisconsin Truck Men Organize.

Frank Brandecker of the Kissel Motor Car Co., Hartford, Wis., has been elected president of the newly organized Wisconsin Commercial Car Association, the organization of truck manufacturers, agents and dealers participating in the Milwaukee Automobile show.

S. Wollheim of the Crown Commercial Car company, is vice-president and C. G. Anderson of the Stegerman Motor Car company, secretary-treasurer. D. F. Poyer, Menomonie; F. L. Cochran, Packard Motor Car company, and E. C. Devlin, Progress Truck company, compose the executive committee.

The object of the organization is to promote an educational campaign for truck owners and drivers. A periodical will be published in which truck operation and upkeep, business methods and trade news will be discussed, and current topics of interest will be considered at the monthly meetings. The annual meeting of the association will be held in connection with the Milwaukee automobile show.

TO TREAT MOTORISTS AS CRIMINALS

"Highway Safety League" Appeals to Pedestrians for Funds—Would Stop "Arrogance of Automobile Owners."

Alleged arrogance of motorists—or what the organizers of the "Highway Safety League" call arrogance—has been responsible for the formation of another of those so-called leagues which pretend to accomplish a lot of good for the "poor, persecuted pedestrian," but who really succeed only collecting "fees" and in creating considerable ill feeling in the various communities in which they elect to exercise their activities. The latest of these "leagues" has as its habitat Boston, the City of Beans and Culture, the Hub of the Universe, and its promoters issue a "call to arms" to "every pedestrian, every person in every city and town of the Commonwealth" to join it. Of course all these "members" are expected to contribute a certain annual membership fee and "such other sums as they are willing to give"—to quote the language of the prospectus. What is to be done with the moneys received in this manner is explained by Moorfield Storey, the president of the League, as follows:

"The makers and users of automobiles are well organized and well provided with resources. We fear they are often inclined, more than they are aware, to the arrogant use of their powers.

"The rest of us must organize also, if we are to overcome the abnormal influence of a powerful moneyed interest with those who make and those who administer the law. We must have adequate funds and the support of a strong public opinion. We need counsel to act for the public, to appear before the Legislature and other tribunals, and also to collect evidence which will insure prosecution in proper cases."

It is also stated that when appeals to the human kindness of automobile drivers fail they should be treated as criminals.

The other officers of the "League" are: Vice-presidents, Albert E. Pillsbury and W. H. Emerson; secretary, Lawrence G. Brooks; directors, A. Shuman, Edward S. Dodge, J. Murray Forbes, Franklin T. Hammond, Royal Robbins, Arthur L. Ware, Corwin McDowell, Dr. Francis H. Rowley, H. H. Chamberlain, Richards Bradley, Charles H. McBurney and Richard Saltonstall.

For an International Show in 1915.

Although it is a long way off, San Francisco already is possessed of the desire to make an international automobile show one of the big features of the Panama-Pacific World's Fair which will occur there during 1915. J. A. Marsh, president of the San Francisco dealers' association, has advanced the suggestion which, of course, has been well received on the coast.

STEAM TRUCK WITH NOVEL ENGINE

American Has Twin Quadruple Expansion Power Plant—Operates on Kerosene and Has Other Unusual Features.

Successful though the steam-propelled commercial vehicle has been in England, every attempt to popularize it in the United States has ended in failure—even when trucks of the successful English makes have been imported. There seems to be something in American air that is fatal to steam trucks—despite the fact that American steam pleasure cars are the best of their kind in the world. Notwithstanding the

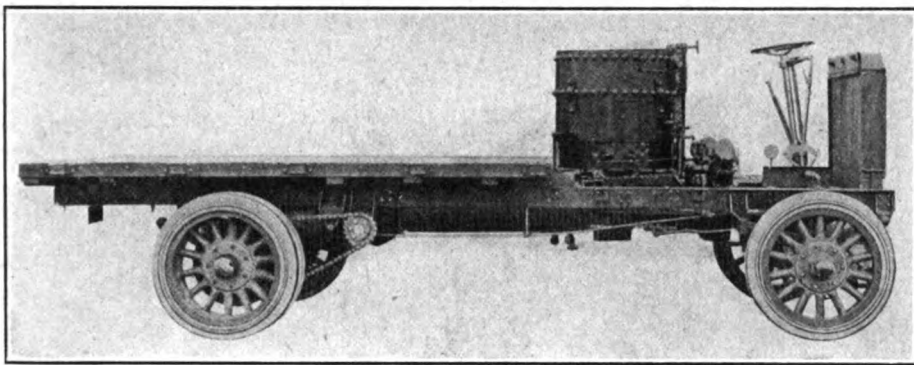
are carried. The maximum speed of the vehicle is 15 miles an hour, without load.

The boiler is 32 inches outside diameter and 24 inches high, with shells of steel $\frac{5}{8}$ -inch thick and flanged heads riveted in. There is the usual water leg between the firebox and the outer shell, and through the upper steam-and-water space pass forty $1\frac{1}{2}$ -inch fire tubes. The efficiency of the boiler and its quick-steaming qualities are very largely due to the use of drop tubes of the Field type, which extend from the "tube sheet" or head of the firebox ten inches toward the burner. As there are 240 of these patented tubes, which maintain a very rapid circulation of the water, the area exposed to the heat is extremely large. An asbestos lagging covers the whole boiler,

cylinder, each cylinder expanding it to a lower pressure and extracting more work and more heat from it. The cylinders of each unit are arranged in two pairs placed tandem; a common piston rod connects the pistons of each pair, and the piston rods extend to a crosshead which carries the connecting rod through which the power of the four pistons, which move in unison, is delivered to the crank shaft. Steam is distributed by means of two balanced piston valves, one serving the two lower cylinders and the other the two upper cylinders; the valves are placed on opposite sides of the engine, and each is between the two cylinders it serves. All of the pistons are under equal pressure, for the pistons upon which the high pressure steam acts are smaller than the low-pressure pistons, and in this way the balance is maintained. The diameters of the cylinders are as follows: High-pressure, $2\frac{1}{2}$ inches, first intermediate, $3\frac{1}{4}$ inches, second intermediate, 5 inches and low pressure, 7 inches. The stroke is 5 inches. Steam is expanded from 300 pounds initial pressure in the high-pressure cylinder to 89 pounds initial in the low-pressure, and cut-off occurs at $\frac{7}{8}$ of the stroke. Steam is supplied through a half-inch pipe, and the exhaust pipe is $1\frac{1}{4}$ -inch.

At normal working speed the engine runs from 300 to 600 revolutions per minute, though it is capable of turning up to 1,000. Reversing is effected by means of a gear which can be thrown over without closing the throttle, and is so designed that it can be used as a brake. Notwithstanding the fact that there is but one crank, the engine has no dead center, owing to the relative positions of the two groups of cylinders.

The condensing system is quite elaborate, and upon it depends the ability of the truck to go through a day's work without replenishing its supply of water, which is carried in two tanks holding 30 gallons each. The system includes an oil separator and a feed water heater, in addition to the condenser proper. Emerging from the low pressure cylinders, the exhaust steam from the two sets of cylinders is all discharged into a single pipe which leads to the oil separator, in which the lubricating oil entrained in passing through the cylinders is extracted. The chief reason for this is that oil has a very deleterious effect on the boiler, and without a separator it is impossible to use a condensing steam plant. From the oil separator the steam passes to the feed water heater, in which it passes over pipes through which the water passes on its way to the boiler. In this the double purpose is accomplished of heating the water, so that it requires less fuel to convert it into steam in the boiler, and of considerably cooling the steam. The exhaust steam pipes next pass through the two water tanks, one after another, still further cooling the steam and heating the water. Lastly, the steam, by this time greatly reduced as to temperature and pressure, goes to the condenser, where it is finally turned into water which is re-



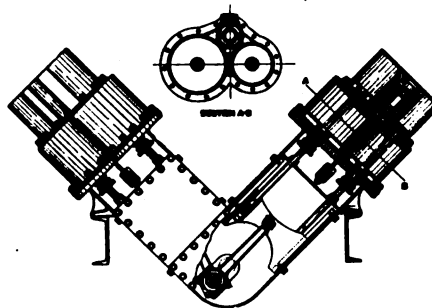
ENGINE AND BOILER LOCATION IN AMERICAN STEAM TRUCK

shadow cast by past history, and despite the manner in which gasoline and electric motor vehicles are covering the commercial vehicle field, a new heavy steam truck is being brought into the market by the American Steam Truck Co., of Lansing, Mich., and which employs an eight-cylinder engine of radical design. The company which exhibited its machine for the first time at the recent Detroit automobile show, will be incorporated with a capital stock of \$500,000, half of which is to be sold and the other half issued to the owners of the company, at the head of which are B. E. Gleason, its mechanical engineer; R. A. Jossman and T. Rogers Lyon. Factory facilities have been acquired in Lansing, which will permit the new company to construct 200 trucks annually.

The power plant of the new five-ton steamer consists of a quick-steaming boiler which embodies many features of the prevailing type of fire-engine boiler, having both water tubes and fire tubes, and working at a maximum pressure of 300 pounds to the square inch, and an eight-cylinder quadruple expansion engine with cylinders arranged in two sets of four and disposed at an angle of 90 degrees upon a single throw crankshaft. Exhaust steam is condensed in a tubular fan-cooled condenser occupying the usual radiator position, first passing through a feed-water heater. Fuel, water and oil are under automatic control, with auxiliary hand controls for emergency use, and supplies sufficient for a full day's work

and outside of this is a jacket of 14-gauge sheet steel.

Any one of three different makes of kerosene burner, 28 inches in diameter, may be used with satisfactory results and, under normal working conditions, without smoke



AMERICAN TWIN QUADRUPLE ENGINE

or odor. The automatic diaphragm operated fire control usually is set to shut off the fire completely at a steam pressure of 300 pounds, leaving only the pilot light burning; the regulator is adjustable, however, and may be set for any desired pressure.

Made entirely at the American Steam Truck company's factory, the engine is the most original and interesting feature of the new machine. It is divided into two units of four cylinders each; the four cylinders are of different sizes, and the steam passes successively from the smallest, or high-pressure cylinder, through the two intermediates to the largest, or low-pressure

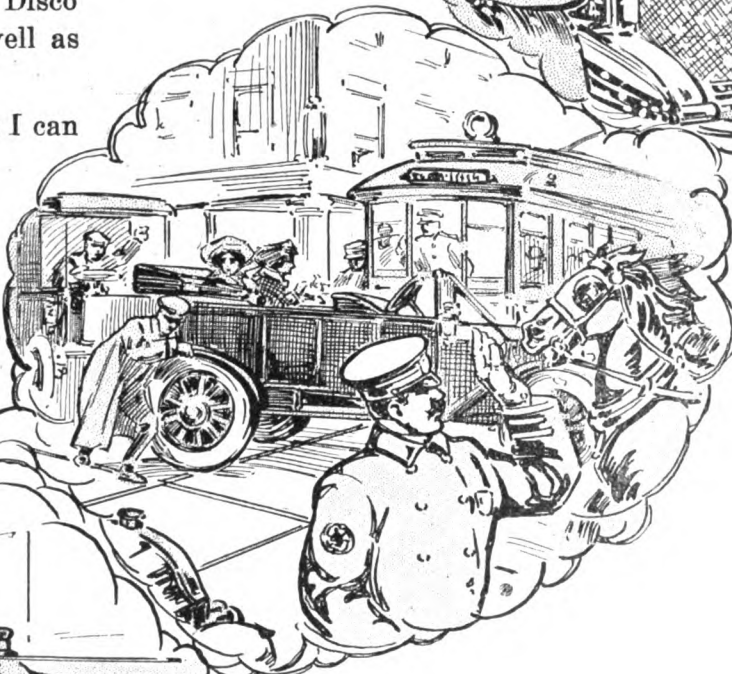
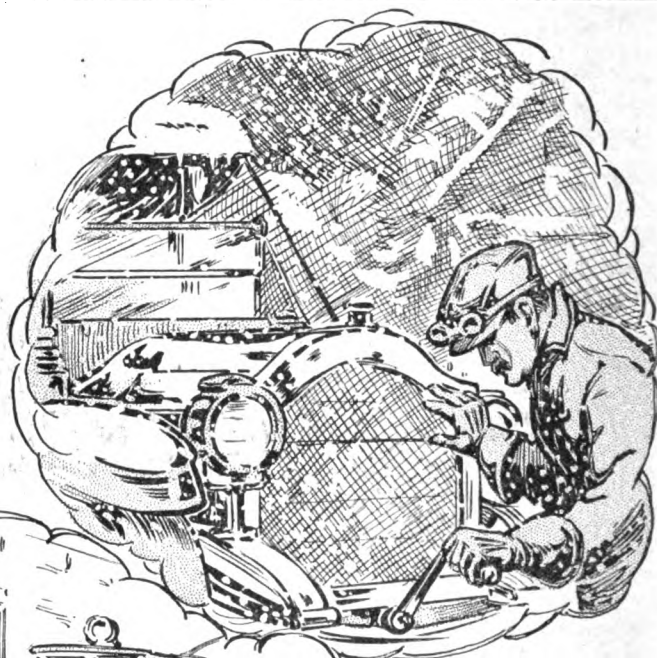
No More Cranking

**"Never Again"—
that's my sentiment
on the crank question.**

With the Disco Starter, my car now starts from the seat. I don't get out of my car in snow, rain or mud to twist that cussed handle. My wife can drive the machine anywhere alone without fear of having to start it herself.

In many emergencies, the Disco saves dangerous delays as well as embarrassment.

I can't afford a chauffeur but I can drive a party to the opera and start for home afterwards with all the grace and dignity of the millionaire and his liveried servants.



When I think of the small cost at which my car was equipped — when I sum up the luxury of simply pressing the button and starting the engine, no matter how cold the weather, no matter how long the car has stood — I can't see why we

didn't enjoy the Disco Self Starter long since.

All my friends who are getting new cars are insisting that the manufacturers or dealers shall equip them with Disco Starters, and all those who have old cars are making them up-to-date with this simple little device. It has but 12 parts, weighs but 4 pounds, and you can have it put on any car in less than three hours.

DISCO Self Starter

A little three inch handle on the dash (or any other convenient place) is the only visible sign of the modern car equipped with the Disco. Its extreme simplicity and absolute dependability account for its approval by the experts of the automobile world, and its adoption by the largest manufacturers.

Put Those Motoring Troubles Behind You!

Don't wait longer, for the practical, successful Self Starter is here—is being manufactured, sold and shipped at the rate of three hundred a day. Prompt deliveries are guaranteed. Any dealer or garage man who has not the Disco already in stock can quickly get it for you. Insist on the Disco—the Self Starter that has revolutionized the automobile business.

See it at any of our branches.

IGNITION STARTER COMPANY

The Largest Manufacturers of
Self Starters in the World.

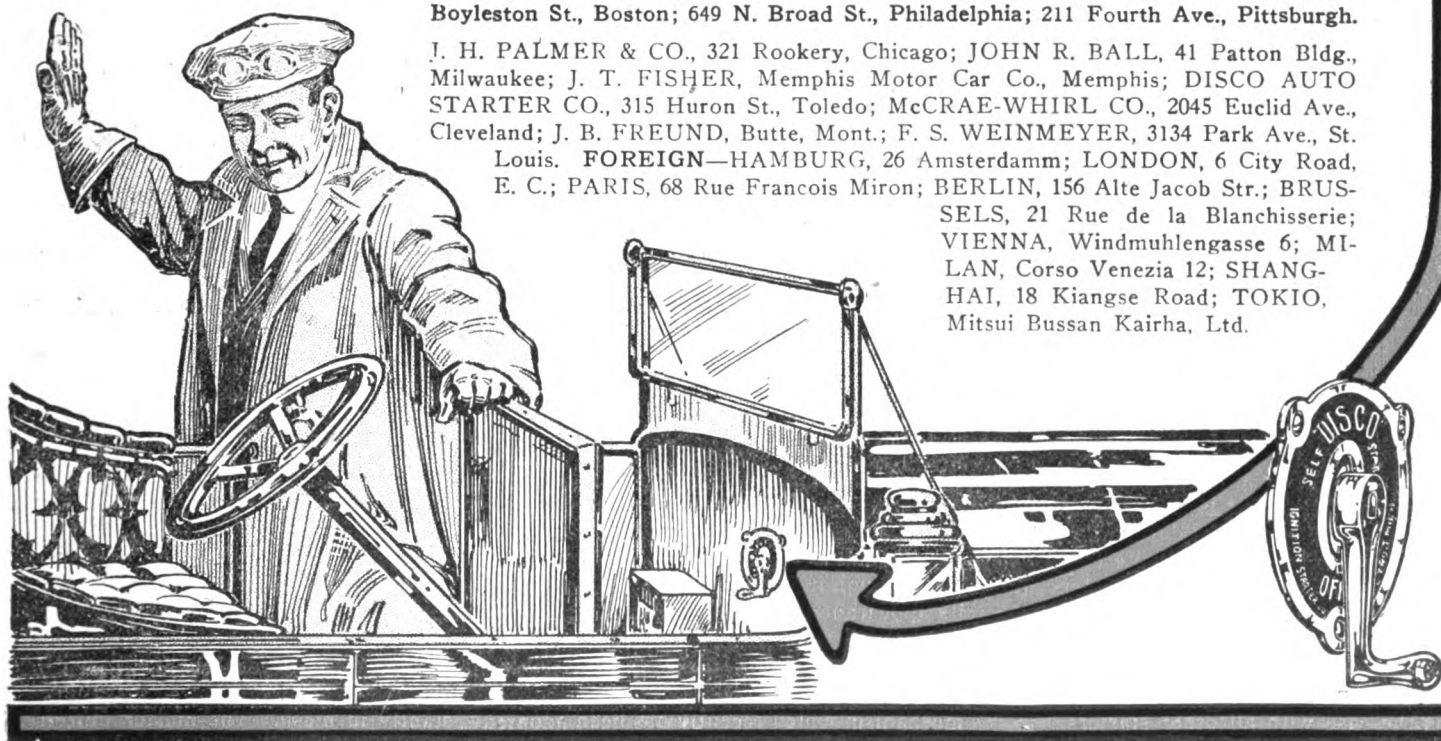
715 Ford Building

Detroit, Michigan

THE ARISTOS CO., Eastern Distributors, 250 West 54th St., New York; 1002 Boylston St., Boston; 649 N. Broad St., Philadelphia; 211 Fourth Ave., Pittsburgh.

J. H. PALMER & CO., 321 Rookery, Chicago; JOHN R. BALL, 41 Patton Bldg., Milwaukee; J. T. FISHER, Memphis Motor Car Co., Memphis; DISCO AUTO STARTER CO., 315 Huron St., Toledo; McCRAE-WHIRL CO., 2045 Euclid Ave., Cleveland; J. B. FREUND, Butte, Mont.; F. S. WEINMEYER, 3134 Park Ave., St. Louis.

FOREIGN—HAMBURG, 26 Amsterdamm; LONDON, 6 City Road, E. C.; PARIS, 68 Rue Francois Miron; BERLIN, 156 Alte Jacob Str.; BRUSSELS, 21 Rue de la Blanchisserie; VIENNA, Windmuhllengasse 6; MILAN, Corso Venezia 12; SHANGHAI, 18 Kiangse Road; TOKIO, Mitsui Bussan Kairha, Ltd.



turned to the tanks to be used again and again.

The steam is condensed in the rear part of the condenser and the water passes to the front part, which is the coolest, and there the water is reduced considerably in temperature before going back to the tanks. Two openings in the top of the cooler provide means of escape for excessive accumulations of steam and also for air when the plant is being started up. The escape openings are piped to the stack which carries off the products of combustion from the firebox of the boiler.

Water is supplied to the boiler by two chain driven automatically controlled pumps. When the water in the boiler falls below the normal level the pumps discharge directly into the boiler until the water rises to the proper height, when the feed is automatically shut off and the water is by-passed to the feed tanks; the pumps run at all times while the engine is in operation. A gauge glass is provided so that the driver can see that there is the proper height of water in the boiler and can check the operation of the pumps, the stoppage of which would be disastrous if not detected.

Engine, boiler, controlling devices and gauges, and the driver's seat all are housed in a cab at the front of the car. The steering wheel is on the left side, and on the column are two short levers, one for the throttle and the other for the reversing gear. Two long levers at the center of the cab operate the brake and the clutch, which is a simple dog clutch that may be used when, for any reason, it may be desired to run the engine light. Water and fuel pumps for emergency use are within easy reach of the driver, and the steam and water gauges are where they can be easily seen and readily illuminated.

Apart from the power plant, the truck embodies such standard features as channel steel frame 6 inches deep, 40-inch wheels in the rear with dual four-inch tires and 36-inch front wheels with single 5-inch tires, propeller shaft drive to a jackshaft and final drive by side chains.

As the boiler is not of the flash type, but normally contains 20 gallons of water, getting up steam requires about 20 minutes. Once fired up, however, pressure is automatically maintained at working point as long as there is fuel in the tank and water enough to make steam. It is impossible for the boiler to blow up.

Engine Starter With Individual Control.

The Eby Auto Parts Co., of Detroit, Mich., is marketing a new engine starter of the acetylene type. It is styled the Hewitt and differs from the usual device of its kind principally in that it permits the control of the acetylene to individual cylinders and the location from the driver's seat of the cylinder that is on the firing stroke. Thus it is necessary to charge only one cylinder to start the engine instead of four or six, as is the case with all other starters.

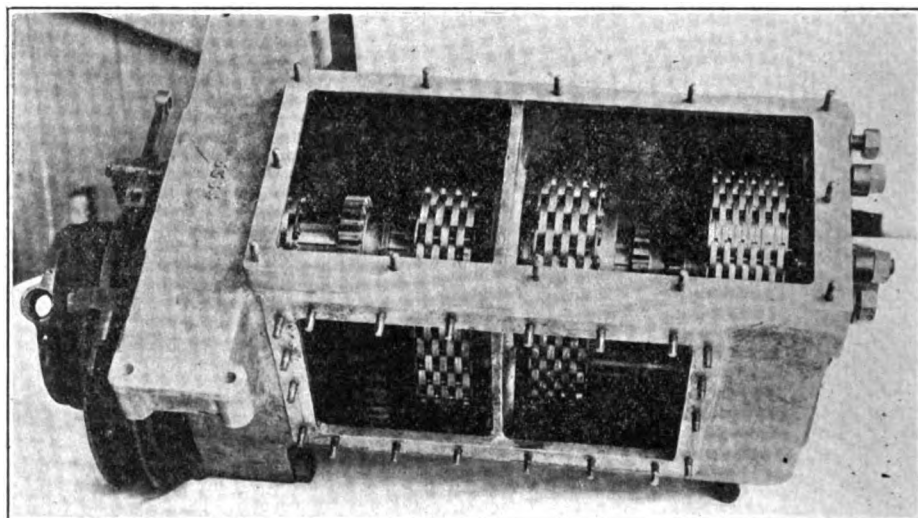
"SILENT" CHAINS FOR GEAR BOXES

How Maudsley Uses Them to Provide Four Speeds, None of Them Direct—Spur Gears Retained for Reversing.

When several years ago the London General Omnibus Co. commenced operations and placed on the streets of London a great fleet of lumbering motor propelled passenger cars they were very far from quiet diligences. In fact, they were so very noisy that complaints were the rule rather than the exception and at length the authorities of Scotland Yard stepped in and forbade their operation until they were altered

for use on the products of the Maudsley Motor Co., of Coventry, England, is of more than ordinary interest. In the first place it might be well to explain that the cost of manufacturing a chain change speed mechanism is higher than is the cost of the ordinary type of gear box and also that its weight complete is slightly greater; the weight of the Maudsley mechanism, two views of which are shown herewith, one of them with the covers removed showing the interior of the case, and the other showing the mechanism in place in the chassis, is close to 100 pounds. Except for these two drawbacks the mechanism possesses advantages which should make it very desirable.

The Maudsley mechanism differs from



THE MAUDSLEY "SILENT" CHAIN CHANGE SPEED MECHANISM

so as to be less offensive to the ears of the public. All of which is history and probably is as well known as is the fact that the greatest step which was made toward quieting the buses was the replacement of the orthodox spur gear change speed mechanisms with others in which "silent" chains took the place of gears.

Immediately, considerable diminution in the amount of noise which they produced became apparent. Other things too became apparent and prominent among them was that the efficiency of the buses was increased; that repair expenses dropped and that depreciation was lessened by reason of the smoother operation of the vehicles. Naturally, such things were not lost on manufacturers and soon after the change was made several pleasure cars made their appearance with "silent" chain "gear" boxes. Other British and Continental manufacturers still are experimenting with them and even in America it is known that at least one manufacturer has the chain change speed mechanism under consideration, though it is not likely that it will make its appearance for some time to come.

Both for this reason and also because it is quite different from anything else that has been produced, the chain change speed mechanism which recently has been adopted

that which is used in the London General Omnibus Co.'s vehicles and also from that which is used in any other cars principally in three essentials. The first of these is that the chains are vertical, the usual arrangement providing for horizontal chains. The second is that there is no direct drive, all the speed changes except reverse being obtained through the intermediary of chains, and the third is that four speeds are provided. For reverse it is inexpedient to use a chain, principally for the reason that it necessitates greater complication and therefore a pair of spur gears is used for this purpose.

Though Coventry chains are used in the box, the arrangement is original with the Maudsley company. In fact the Coventry Chain Co. disclaims any credit for the design, of which, it is quoted as saying, it does not approve. A vertical arrangement of the chains was necessary, it is explained, for the simple reason that no direct drive is used.

To obtain the various speed changes, the wheels over which the chains are locked to the driving shaft by means of positive dog clutches similar to those which are used in any of the several American change gear mechanisms in which the gears are constantly in mesh. The master clutch which

is used is of the leather-faced cone variety and is equipped with a brake to facilitate "gear" changing. Lubrication is effected by oil, the same quality and viscosity being used in both the engine and the change speed mechanism.

Though the box is designed to transmit 30-horsepower at 1,000 revolutions a minute high factors of safety on all the chains will permit of considerable overload. The actual factors of safety which are allowed are as follows: first speed chain, 6.3; second speed chain, 7.25; third speed chain 9.06; fourth speed chain (high speed) 12.03. The distance between chain wheel centers obviously is the same in each case, the exact measurement being 4.468 inches. In common with the several other chain change

raise the cost to about \$4 and \$5, respectively, for the two sizes.

Within certain limits, defined largely by the allowable diameter of the chain wheels, almost any gear ratio may be obtained. After considerable testing, however, the Maudsley company has adopted the following ratios as being productive of the best results: first speed (low), .518; second speed, .800; third speed, 1.25; fourth speed, 1.93; reverse, .523.

Barring the remarkable efficiency of the mechanism, silence of operation is the particular feature of which the manufacturers are proud. It is pointed out that by reason of the silent operation of the chains there is no necessity for a "direct" drive for which no provision has been made. There

the purpose. After filing, the valve should be placed on its seat and moved as in grinding, with a little "marking" of some sort to show where it touches. By repeated reducing of the high spots, the filing becoming lighter and being done more gingerly as the valve approaches a seating, the surface can be made good enough so that the work can be finished by grinding in the usual way, beginning, however, with the coarsest grade of the grinding compound, so as to rapidly cut down the unevenness of the surface. It is not necessary to get a bearing for the full width of the valve seat—a bearing a sixteenth of an inch wide is enough—but the circle must be absolutely unbroken or leakage will occur. If the valve is in a removable cage its tightness is easily tested by removing the cage, inverting it with the thoroughly cleaned valve in place and pouring in a little gasoline. This fluid will leak through a very minute opening and therefore if the valve holds it, the seat cannot be very far from right:

Asbestos Gaskets and Their Application.

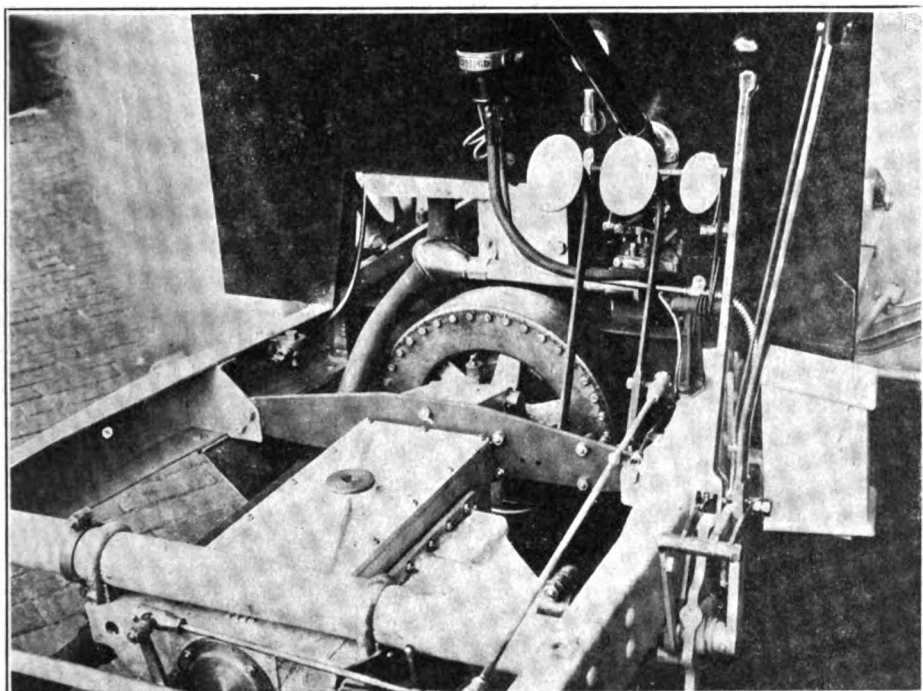
Ordinary asbestos board or sheet is of little or no use for exhaust pipe gaskets, as it is too easily blown out. Wire asbestos, in which copper or brass wire netting is embedded in the material, is better, but the regular sheet metal gaskets with asbestos fillings are best. On the intake side even common asbestos sheet can be used with satisfactory results. In the case of a joint where the surfaces are very uneven, dampen the gasket and set up the bolts of the joint while the asbestos is still soft. Wait until it dries before running the engine, if possible, because when damp, asbestos sheet is very pulpy and unstable.

Lessening the Noise of Filing Metal.

Sometimes there arises the unpleasant necessity for filing the edge of a piece of sheet metal—a process that is commonly accompanied by a volume of noise all out of proportion to the amount of actual work done. Much of the ear-splitting racket can be avoided by filing along in the direction of the sheet instead of across it, and it helps, too, if the sheet is held between blocks of wood placed in the vise. The edge to be filed should be kept as close to the vise as possible. Not only is the ear relieved by these precautions, but much better and quicker work usually can be done.

How Oil Injures the Upholstery.

While most people who have been accustomed to taking care of horse-drawn vehicles know that oil is destructive to the finish of enameled leather, many motorists who take care of their own cars are not so well informed. Enameled leather should be cleaned with weak soap and water, and polished with a very soft cloth or chamois. Oil of any kind will soften it more or less rapidly, destroy its brilliancy and cause rapid deterioration.



MOUNTING OF THE MAUDSLEY CHAIN "GEAR" BOX

speed mechanisms which are in use, however, two sizes of chain are used, the pitch of the first and fourth speed chains being $\frac{5}{8}$ of an inch, and that of the second and third being $\frac{3}{4}$ of an inch.

One of the prominent features of the "silent" chain is its truly remarkable efficiency and in this respect the Maudsley mechanism is no exception to the rule. Repeated tests have shown the efficiency to be 97 per cent. under ordinary running conditions, and this in itself almost is sufficient to offset the disadvantages of added weight and increased manufacturing cost. But even though initial cost is slightly higher than is the case with the spur gear box, the cost of repairs, or of replacement of chains is very low and the amount of time required for either job almost is nil. Twenty minutes suffices to replace a chain, it is claimed, and the cost in the case of the larger ones is a little over \$3, and in the case of the smaller ones \$2.25. These figures do not include duty which would

are other features too for which great claims are made and prominent among them is that the chains actually act as a safety link in the transmission system. Which is to say that if an inexperienced or careless driver should "drop" the clutch into engagement the worst that could happen would be the breakage of a chain. The cost of repairing the chain, or of replacing it, it is pointed out, would be considerably less than the cost of replacing a stripped gear, the latter operation necessitating almost the complete dismantling of the ordinary gear box.

Refacing a Worn or Pitted Valve.

A valve that has been neglected until its seat is worn out of round and is pitted badly, so that some more rapid method of re-seating is required than grinding, ought to be faced up in a lathe; but in the event of this being impossible, the work can be done by reducing the high parts with a file, a small "smooth" file being the best for

NOT THE NATION'S JUGGERNAUT

Official Census Figures Show Automobile To Be Safe Vehicle—Country's Largest City Comparatively Safest One.

It must come as something akin to a shock to people who have been waging a crusade against the alleged "terrible toll of life taken in New York street accidents," to learn that this much-abused city has the lowest pro rata number of fatal accidents of any city in the United States, with the exception of Paterson, N. J. And still greater must be the surprise of the public to learn that the automobile has caused less than one-half the number of deaths attributed to the common street car—a vehicle which travels in a prescribed path on rails, makes enough noise to be heard a half dozen blocks away, and is supposed to be handled by experienced, capable men free from "joy-riding" tendencies. The comparison becomes still more interesting when it is remembered that the number of automobiles at present running in the United States and that of street cars are practically the same, that is to say, in the neighborhood of 450,000.

According to the Census figures, which cover the year 1910, the 45,416 fatal accidents were divided as follows:

Railroads	7,877
Drowning	4,818
Burns	4,182
Mines and quarries	2,484
Street cars	1,949
Gas (not suicides)	1,379
Machinery	1,299
Automobiles	980
Other vehicles	1,940

In addition to the deaths from burns 745 persons died in conflagrations. Food poisoning killed 157 people and 1,227 died of acute poisonings. Landslides caused 556 deaths; animals, 502; starvation, 38; excessive cold, 254; heat, 8,206; lightning, 156, and electricity, 478.

Pennsylvania had the largest number of deaths in both 1910 and 1909, but Colorado had the highest rate in both years, there being an increase of 23.9 in 1910 over the 1909 figures. New York held second place in number of deaths in both years, while Montana ranked second in rate in 1910. Vermont reported the smallest number of deaths in 1910. New Hampshire in 1909. Wisconsin had the lowest rate in both 1910 and 1909. Nearly three-fourths of the States in the registration area showed slight increases in the number of deaths in 1910, and almost as many had increased rates in the same year.

The deaths by violence in the chief cities in 1910 were:

	No. of deaths.	Rate per 100,000 of pop.
San Francisco	399	95.3
Denver	178	82.8

Washington	261	78.6
Chicago	2,094	95.4
New Orleans	387	113.8
Baltimore	441	78.8
Boston	646	95.9
Detroit	400	85.1
Kansas City	309	123.6
St. Louis	604	87.6
Jersey City	281	104.4
Newark, N. J.	302	86.2
Paterson, N. J.	93	73.7
Albany, N. Y.	81	80.7
Buffalo	411	96.5
New York	3,758	78.3
Cincinnati	351	96.4
Cleveland	471	83.5
Philadelphia	1,299	83.6
Pittsburgh	719	134.3

The highest death rate by violence was in Memphis, Tenn., 195.5 per 100,000 of population.

Automobiles "Laundered" While You Wait.

What is termed a "motor car laundry" has been opened in Portland, Ore. In reality it is nothing but an "overgrown" garage, but the word "laundry" has caught the fancy of the folks on the Pacific Coast and as a result the owner of the new garage, H. T. Barnhart, is kept more than busy. The system in vogue is somewhat on the style of killing hogs in a Chicago slaughter house. When the car enters the garage through one of the doors on Twenty-first street it is soaked by one gang of men, soaped by a second, passing on to a third where water is used; a fourth gang rough dries it, a fifth air-dries it, a sixth polishes the body, a seventh polishes the brass, and when the car finally reaches the exit door on Washington street, it is as clean as can be—robes, cushions and rugs are vacuum-cleaned. The company running this "laundry" takes no cars in storage or for rent, but conducts a cleaning establishment pure and simple, and claims to be able to handle 100 cars per day.

Five Damage Suits For One Accident.

Five suits aggregating \$27,500 have been filed against the Auto Livery Co., of Washington, D. C., as the result of an accident in which the five plaintiffs were injured by one of the livery company's taxicabs. According to the complaint the taxicab ran into the automobile carrying four members of the Hilleary family and Zedie L. Flather, throwing them against a tree and down an embankment. As the collision occurred from the rear it is claimed that no responsibility for the accident can be placed on the driver of the Hilleary car.

Syracuse Accident Cost State \$3,802.34.

According to the report of Albert E. Brown, State Fair Commissioner, the accident during the automobile races at last year's State Fair at Syracuse, cost the State the sum of \$3,802.34 in hospital and funeral expenses for the injured and killed. As several of the survivors and relatives of those killed have announced their intention of suing the State for damages, this amount is likely to be still further augmented.

NEED NOT STOP, LOOK AND LISTEN

New York Court of Appeals Frees Pedestrians from Responsibility at Street Crossings—Drivers to Use Care.

That the rule requiring persons to "Stop, Look and Listen," when about to cross railway tracks cannot be applied in connection with automobiles or other vehicles at street crossings, is the decision of the New York Court of Appeals in the case of Mary E. Baker vs. William J. Close et al., in which the plaintiff was injured by being struck by the running board of an automobile belonging to William J. Close, while attempting to cross a street in Schenectady, N. Y. The defense admitted that the driver had been negligent, but contended that the plaintiff was not entitled to damages because she did not take proper care in avoiding the automobile. Their argument was based on the assumption that persons afoot were required to be just as careful of automobiles as they would be in crossing railroad tracks, where the rule "Stop, Look and Listen" applies.

But the Court of Appeals, in affirming a judgment against the defendants, ruled that the conditions are different at city street crossings, where "the right of passage is common to all, and drivers are bound to exercise reasonable care for their safety and the safety of others in the street."

Persons afoot, the court pointed out, are not required under the law to look both ways and listen at a city street crossing, but only to use reasonable care, for they have the right to assume that a driver also will use due care and approach the crossing with his vehicle under proper control.

"The application of these simple rules to drivers of automobiles is obvious," declared the court. "It is a fact of common knowledge that automobiles traverse our city streets at much greater speed than other vehicles, and yet they are more easily controlled. In crowded centers the danger is proportionate to the speed, and there seems to be no good reason why the care should not be measured by the danger. The rule which fixes the rights of drivers of ordinary vehicles in the use of street crossings cannot be relaxed in favor of automobiles, for while they are instrumentalities which afford great pleasure, convenience and utility to many, they are undoubted sources of danger to many more. The wisdom of carefully observing these simple rules of the road is well illustrated by the case in hand. If the defendants' driver had taken the wise precaution to check his speed at this crossing, or even to slightly change his course, the plaintiff would probably not have been injured, for the evidence is conclusive that she had all but escaped when she was caught by the running board on the farther side of the automobile."

MASSACHUSETTS TO LIMIT TRUCKS

Highway Commission Advocates Bill Forbidding Use of Vehicles Weighing More Than Six Tons, Loaded.

A storm of protest has been raised in Massachusetts following the report of the State Highway Commission advocating that a bill be introduced in the Legislature, which will limit the total weight of trucks of all kinds to six tons, inclusive of load. This means that practically every truck rated at $3\frac{1}{2}$ tons carrying capacity and over, would be barred from the roads of Massachusetts, as none of the $3\frac{1}{2}$ -ton-truck chassis weighs less than 5,500 pounds. Although the proposed ordinance does not expressly forbid the use of heavier vehicles, it makes it compulsory for the owner or driver of such a truck to obtain individual permits from the authorities in charge of the various highways, bridges, etc., to be traversed by the truck. As one of the men intimately connected with the truck trade expressed it: "This would mean that every time a driver of a three or $3\frac{1}{2}$ -ton truck starts out from Boston to Worcester or some other town in the State, he would have to carry a sheaf of permits with him—provided he succeeds in obtaining the permits in the first place."

The bill not only limits the size of the trucks but also the speed at which commercial vehicles, of two tons capacity or over, may travel over the open highways—the speed limit in this case being fixed at eight miles an hour. It is particularly in connection with this latter stipulation that the wrath of the vehicle manufacturers is greatest. They point out with some asperity that the heavy duty motor truck has come to stay, and instead of trying to legislate it out of business because the highways are not qualified to withstand the wear and tear, the State Commission should rather reconstruct the highways in such a way as to come up to modern requirements.

The nature of the sentiment among truck manufacturers and dealers doing business in the Bay State is best shown in the statements appended here:

President E. A. Gilmore of the Bay State Automobile Association said: "Such a bill is a blow at the trucking industry. It seems to me that Massachusetts is making a great mistake to be the first State in this country to take such a radical step. The way the bill is drawn it would practically eliminate all commercial vehicles except very small ones."

Fred O'Brien of the Pierce-Arrow company said: "If they are talking about such legislation this company might as well go out of business, for we would not be able to sell any more five-ton trucks. Governor Foss's concern at Hyde Park uses one of

our five-ton trucks, and in the case of his signing such legislation he will have to give up using his truck. I don't think trucks injure the highways as much as pleasure cars. They roll the ground down because there is not a large amount of speed."

R. L. Smith of the Mais Truck Company said: "We make trucks from 1,500 pounds to five tons and it would practically kill our business. The coal people must have a truck to carry heavy loads in order to make it a paying proposition. A small truck would not do, for it would be ruined in a short time. Therefore such legislation, for economic reasons, must be opposed."

Mr. Whitney, of Whitney & Barney, of Boylston street, said: "It seems to me that this legislation is rather extreme and would be almost prohibitive if anything of the sort should be adopted."

George Hudson, agent of the Alco company, said: "It is not at all economic to run a heavy truck at a high rate of speed. The trucks we build weigh up to $6\frac{1}{2}$ tons, and under the proposed legislation there is not a truck that we make that we could sell in Massachusetts."

Lawmaker Would Light Country Roads.

Instead of requiring all vehicles to display lamps at night, Loren H. White, one of New York's "up-State" Senators, would have the State and county authorities light the country highways by electricity. In the opinion of Senator White, the blame for accidents only too often is placed on the motorist when there is no reason for it, the collision being due chiefly to the inky darkness which covers all country roads. And he thinks that it is no more than right to make the counties or the State do something towards remedying this state of affairs. His bill provides for the experimental lighting of a section of highway, not to exceed a distance of ten miles, as a test, and asks for an appropriation of \$25,000 for that purpose. If the experiment proves successful and the cost involved is not too high, the senator will move for an extension of the system.

Wisconsin State Body Elects Directors.

At the annual meeting of the Wisconsin State Automobile Association last week, the new board of directors was elected as follows: A. J. Horlick, Racine; H. L. Halverson, Whitewater; F. Prinz, Milwaukee; A. P. Cheek, Baraboo; George A. West, Milwaukee; Louis T. Hill, Sparta; M. C. Moore, Milwaukee; C. A. Conro, Rhinelander; Dr. Louis Fuldner, Milwaukee; Dr. T. E. Loope, Iola; J. W. Tufts, Milwaukee; J. F. Plum, Manitowoc; J. W. Bryant, La Crosse; F. J. Edwards, Milwaukee; Dr. A. E. Recor, Appleton; R. D. Gorham, Monroe; O. F. Fishedick, Milwaukee; W. K. Coffin, Eau Claire; J. T. Drought, Milwaukee; W. D. James, Fort Atkinson; A. F. Winter, Sheboygan; W. H. Raymond, Milwaukee; Jud Alexander, Milwaukee; P. C. Avery, Milwaukee; Lester Clark, Lancaster.

WOULD ADOPT STANDARD SIGNAL

Three Bills Introduced in Massachusetts With Same Object in View—"Harmony" Board Suggested.

Three bills have been introduced "by request" in the Massachusetts Legislature in an endeavor to evolve a "standard" automobile signal—in which State the law now provides that "no bell, horn or other device for signaling shall be sounded so as to make a harsh, objectionable or unreasonable noise."

The Highway Commission, being the repository of everything that concerns the automobile, is selected by one petitioner as the judge of what an automobile signal ought to be. If the measure should go through, this commission, in addition to its qualifications as road builder, telephone supervisor and automobile law administrator, would have to constitute itself a harmony board.

The bill reads that the horns or signals used in or upon automobiles, motorcycles and other motor vehicles shall be uniform in sound, and shall conform in the strength and quality and character of the sound to a standard established by the Massachusetts Highway Commission; and no other horn or signal by sound shall be used in or upon a motor vehicle. Fire and police wagons and ambulances are exempt, but any other motor vehicle whose horn is out of tune, may subject its owner to a fine of from \$5 to \$100 every time it blows in discord.

The second bill is more definite, and is essentially a copy of the one recently adopted in Chicago. It requires an abrupt sound, sufficiently loud to serve as an adequate warning of danger, which shall be heard above the noise of traffic, and provides further that this abrupt and sufficiently loud sound shall not be used to make unnecessary noise, and must not be employed except as a warning of danger.

The third bill before the Legislature is distinctly retrogressive from that Utopia of harmony of sound in the streets, for the petitioner would take out of the present law relating to motor vehicle warning signals the words "harsh, objectionable" and have the only restriction as to the sound of the horn or other device that it must not be unreasonable.

This wide range between a standard sound or "strength, quality and character" to be determined by the Highway Commission to a tonal nicety and the "harsh, objectionable" sound that was barred out two years ago will be considered by the committee on roads and bridges, to which the measures have been referred. The date for the hearing at which this cacophony of sound is to be analyzed has not yet been set.

FITZGERALD ON ENGINE STARTERS

Disco Representative Discusses the Subject at Length at S. A. E. Meeting—His Opinions and Suggestions.

Though in offering as his opinion that the engine-starter that is destined to attain to greatest popularity will be of the acetylene type, J. W. Fitzgerald, who is connected with the Ignition Starter Co., of Detroit—which accounts in a measure for his partiality—and who read a paper on the subject before the annual meeting of the Society of Automobile Engineers scarcely gave utterance to radical ideas, some of his conclusions in reference to the various other types of starters on the market are worthy of more than passing interest. All of them he dismisses summarily as being far inferior to what he styles the "ignition starter," the appellation being, particularly apropos by reason of the fact that starters of either the acetylene or gasoline type depend for operation on the ignition system.

"In reference to air starters," he said, "it would seem that most all classes require a great deal more mechanism than a good designer would care to attach to his engine, especially in view of the none too positive results. Some very good men are constantly at work on the problem of using air, and it is quite likely that a device very much simpler in every detail than any that has been built up to date will be brought out. There does not seem, however, any way to overcome the most serious trouble, viz., that of chilling the cylinder walls by the admission of the compressed air. . . ."

Electric starters, he dismisses quite as summarily, citing as their greatest drawback their complexity and the amount of auxiliary machinery necessary. "The combination of electric motor controller, storage battery and the necessary gearing arrangement adds a great deal of weight to the engine equipment, and all of the individual parts are expensive and complicated," he asserts, although he admits that "as long as everything is kept in running condition the device gives absolutely perfect satisfaction. An objection to this device would seem to be the difficulty of having parts made in case of trouble. The device is so complicated and so little known as yet that even a first-class automobile man cannot make repairs on it. This could be eliminated to a great extent if it were possible to get the device generally adopted and establish a first-class service department. The high cost of electric starters probably will preclude their general use except on the higher-priced automobiles and motor boats."

"In order that an engine shall start on the spark," Fitzgerald proceeded to explain when he got around to "ignition

starters," with which subject he very evidently was more familiar, "it is necessary that the engine stop in a balanced or normal condition, and that a good spark is produced when the switch is thrown on. Finally, there must be a good explosive mixture in the cylinder to be ignited. All engines will fulfill the first two conditions; it then becomes necessary for the starter to furnish the cylinders with an explosive mixture to be ignited.

"The failure of gasoline-ignition starters can be charged to the operator in most cases, because good judgment is required on his part as to how much mixture to force into the engine. Gasoline has a very small range of explosibility, approximately from nine to fourteen; that is, a mixture of air and gasoline with less than 9 per cent. of gasoline cannot be exploded, nor a mixture richer in gasoline than 14 per cent. This ratio can be maintained easily by the carburetting device, but it is affected greatly by the condition of the engine itself. When the engine is cold it can be charged with a mixture from the force-feed carburetter and fired with little difficulty, but when it is fairly warmed up care must be used with the amount of mixture put into it. If too much of the mixture is put into the cylinder when it is warm it floods it. In other words, it makes the mixture too rich in gasoline, so much so that it will not ignite. This is due to the fact that an engine that is warm has, of necessity, been running and still retains a certain amount of gasoline in some state in its cylinders. Just how much is in the engine has to be guessed at by the operator, and it is a question of his judgment how much more he shall add in order to get a firing mixture. The ordinary driver will not, as a rule, have the patience, or take the time to experiment on this point, and consequently is not able to get the best of results from starting devices using gasoline as a fluid. The efficiency of these starters has been increased by the use of ether mixed with the gasoline, and also other chemicals tending to make the mixture more highly explosive and increase its range of explosibility. But this was found objectionable on account of the necessity of providing the additional fluid. Contrary to the general idea, gasoline of high specific gravity does not give as good results as the lower grades, due to its tendency to flood a hot engine much more easily.

"Many of these difficulties with ignition starters have been overcome by the use of acetylene gas. A great many starters using acetylene as a power fluid have been developed within the past couple of years to a very high degree of efficiency. Before describing any of these devices we will first discuss the nature of acetylene.

"This gas is now being used very largely commercially and as furnished by the best grade of manufacturers is practically pure, and stored in such a manner as to be easily used in connection with automobiles or

motor boats. For these uses it is compressed and held in copper-plated steel tanks of varying sizes. These tanks are first thoroughly tested to a point that gives them a factor of safety of several hundred per cent. They are then completely filled with a porous material of some nature, which chemical has the quality of absorbing many times its own volume of acetylene. The largest manufacturer of gas for use on automobiles uses a chemical called acetone, which has a greater absorbing power for acetylene than any other chemical known. Other companies use chemicals of a similar nature, but, as far as shown, none of these seems to have anywhere near the absorbing capacity of acetone. After the acetone is put in the tanks are connected to a gas supply containing acetylene and filled to a pressure of approximately 260 pounds. It requires three stages of filling to obtain the pressure. The effect of storing the acetylene in this manner is to do away absolutely with any danger from an explosion. The acetone passes into the thousands of little pores in the asbestos packing, and each small portion of acetone in these pores contains its proportionate amount of acetylene. If it were possible to ignite or fire any part of the gas in the tank an explosion or flame could not travel to the surrounding acetone. A construction of this nature consists of thousands of small tanks and, although they are connected as far as being able to draw the gas out of them is concerned, the physical connection is so small as to prevent the propagation of the flame or explosion from one cell to another. Heat may be applied to any one part of the tank, and beyond a disintegration of the gas at that particular spot, which is shown by a deposit of carbon, no other effect can be found. The gas in the immediate vicinity of the heat is freed into its elements of carbon and hydrogen, but it is not exploded or fired. If the whole tank should be dropped into a furnace, the result would be the melting of a safety-fuse plug in one end of the tank, which would permit the gas to escape. The escaping gas would, of course, be ignited and furnish a very hot flame, but there would be no explosion. At the outlet of the tank, where connection is made to the lights or the starter, there is placed a block of porous carbon material to prevent any possibility of a back fire.

"Before the acetylene gas is stored in the tanks it is thoroughly cleaned and dried and as sold to the user is commercially pure. The composition of acetylene is identically that of gasoline, being made up of carbon and hydrogen, although the proportions are different in the two fluids. Acetylene contained in a tank not under pressure cannot be exploded by heat, flame, electric spark or even an electric arc, but can be exploded by a percussion cap of fulminate of mercury. Even when exploded in this manner, however, the explosion does not take place all through the gas, but only

in the immediate vicinity of the mercury cap, as is shown by the presence of pure acetylene after an experiment of this kind. This condition holds good even when the acetylene is under compression up on a point of about 30 pounds. That is, pure acetylene is not explosive in itself when under a pressure of less than 30 pounds. When acetylene is put under a pressure greater than 30 pounds, it becomes a very unstable gas and can be exploded in various ways without mixing any air with it. It cannot be exploded, however, when under high pressure, by any jar or sudden blow, but must be ignited by a flame or spark. This liability to explosion under pressure is taken care of by the conditions under which the gas is stored as just described.

"If there is any leakage around the tank connections escaping acetylene mixing with the air forms an explosive mixture of about the same power as ordinary lighting gas; the only difference being that a much greater range of mixtures of air and acetylene can be exploded. A 3 per cent. mixture of acetylene and air can be exploded; a mixture 85 per cent. rich in acetylene can also be exploded. It is this range of explosibility that makes acetylene so adaptable to use for self-starters.

"The force of an explosion of a mixture of acetylene and air varies greatly under the conditions under which it is exploded. With a very slight per cent. of acetylene the explosion is weak; with a mixture of from 12 per cent. to 15 per cent. of acetylene we get the strongest explosion consistent with the proper and complete burning of the elements entering into the combustion. With higher percentages of acetylene we get a stronger explosion, but with a heavy deposit of carbon, as there is not sufficient oxygen to properly unite with all of the carbon. The highest pressures are obtained with equal parts of air and acetylene. This high pressure is caused by the slow-burning effect of a mixture too rich in acetylene. When ignited it burns slowly and a part of the heat is transmitted to the mixture surrounding it. This increase in temperature raises the pressure of the remaining mixture and by the time it is ignited it is under compression and therefore gives a high pressure on account of being exploded under compression. Any mixtures of acetylene above 15 per cent. are not proper mixtures to use as power mixtures, because they do not fully burn up all of the carbon in the acetylene, but leave it behind in the shape of a very fine carbon deposit. A proper mixture of air and acetylene exploded at atmospheric pressure gives only a slightly greater explosion pressure than a proper gasoline vapor. A proper mixture of air and acetylene exploded at atmospheric pressure gives only a slightly greater explosion pressure than a proper gasoline vapor. Correct mixtures in connection with starting devices are more or less difficult to obtain, on account of the varying conditions existing in the engines to be

started. So, as a rule, explosion pressures furnished by acetylene mixtures are considerably below what would be furnished by a gasoline mixture. If the mixture is above 85 per cent. acetylene, it cannot be exploded at all. The presence of any carbon dioxide, which is one of the results of a gasoline explosion, has a strong tendency to lower the explosion range. All ignition starters should be designed so as to furnish an explosive mixture no greater in power than the mixture furnished by the engine carburetter.

"Pure acetylene is a colorless gas with a specific gravity of about 0.9; is slightly less poisonous than city gas, and has a sweetish odor. It has no effect on metals in a free state, except copper and silver. A compound passing pure acetylene over pure copper, which composition is in the nature of an explosive fulminate. For this reason no pure copper should be used in connection with acetylene.

"Some theories were advanced that acetylene had a damaging effect on the cylinders and pistons of an engine. These ideas were brought out by the fact that engines using acetylene had all the carbon deposits cut out of them. It is true that engines using acetylene starters are generally free from carbon and soot, but this is not due to any effect produced by acetylene. It is due entirely to the cleansing effect of the acetone in which the acetylene is stored, a portion of which is carried over into the cylinders by the acetylene. Acetone has the property of cutting or dissolving the gummy and oily products which hold the small pieces of carbon together, thus loosening and breaking up the carbon deposits. A properly designed acetylene starter for these reasons cleans the motor of all carbon deposits. But if it is not designed correctly it will aggravate the carbon deposits in the engine by the production of more carbon and soot through imperfect combustion, due to too much acetylene.

"There has been considerable discussion as to the relative explosive power of acetylene mixtures and gasoline mixtures. The best authorities show that the explosion powers of acetylene mixtures vary from 7-10 of a pound to 300 pounds, depending upon the percentage of acetylene and air when not under compression. Low explosive pressure is produced when the percentage of acetylene is only $2\frac{1}{2}$ and the highest is given when the acetylene and air are of equal parts. As the percentage of acetylene is increased above 50 per cent., the explosion pressure decreases until such a point is reached that no explosion occurs. Acetylene mixtures exploded under compression give results varying over wide ranges, but in general the explosion pressure is from four times to ten times the compression pressure, the higher values being obtained as the compression pressure is increased. This statement applies to such compression pressures as obtain in the ordinary gas engine. * * *

"The advantages of ignition starters are in general extreme simplicity, lightness and ease of application and operation. Their main and distinguishing advantage is their ability to warm the walls of the cylinders when the explosion takes place, so that the incoming mixture from the carburetter is warmed and kept in a gaseous state by the heat imparted to the cylinder walls from the explosion of the acetylene mixture. With a very cold engine it is possible to spin it rapidly for 50 to 60 turns without getting any results, because the engine is too cold to hold the gasoline vapor in a gaseous state after it comes from the carburetter. The same motor started by means of an acetylene starter, will often fire its charge on the first few turns due to the warming effect of the acetylene which is burned alone.

"Ignition starters require that the engine be kept in first-class condition. If the ignition system is out of order or the cylinders or pistons are in such condition that the engine sticks on dead center, the engine becomes inoperative. The function of the starter is to charge one or all of the cylinders as the case may be, with an explosive mixture, and it is then the part of the ignition system to fire this mixture. Of course if the engine has stopped on center, it cannot be started by an explosion, no matter how strong, and in such a case, it must be moved off the center. An engine kept in proper condition as regards tightness of valves and proper lubrication, will not stop on center more than 1 per cent. of the time.

"It is hardly necessary to discuss the effect on the engine of starting on the spark, which action is produced by ignition starters. The explosion occurring in the first cylinder to be ignited is very slight, especially as the mixture in that cylinder is not under compression. In fact if the motor is very stiff the power produced by the explosion of a proper acetylene mixture will not be sufficient to turn the engine over. Experiments conducted on an automobile engine for more than 10,000 starts showed absolutely no measurable wear on the bearings. I have stated the maximum explosive pressures it is possible to obtain with acetylene mixtures not under compression, and it is evident from these figures how absurd the statements of blowing off cylinder heads and otherwise damaging the engine are. Under no condition is the strain of starting by exploding a mixture in the cylinder as great as that produced while running under load and having one or two of the cylinders miss fire.

"On account of the general use of acetylene gas and the extreme simplicity and positiveness of action of well designed ignition starters, the absence of moving parts and the elimination of all attention and adjustment I believe that the starter described is one that will meet with universal and successful adoption."

Under the lure of new lamps for old have you formed the habit of exchanging old bad tires for new bad tires?

You own an automobile.

You have tire troubles—and always will until something radically different is invented to take the place of air surrounded by rubber.

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998,953. Resilient Wheel for Vehicles. Courtland G. Capwell, Roslindale, Mass., assignor of thirty-seven one-hundredths to Fred Rawitser, South Acton, Mass., and twenty-five one-hundredths to John H. Moore, Boston, Mass. Filed Sept. 12, 1910. Serial No. 581,712.

1. The combination, with inner and outer hub members, the latter loosely surrounding the former and having attached spokes, and symmetrically disposed, concave abutments on the inner circumference of the outer member, of a plurality of cylinders mounted on the inner hub member, each cylinder being interposed between an oppositely located pair of abutments, and spring-controlled plungers carried by and longitudinally movable in each cylinder and held in yielding engagement with the corresponding pair of abutments, the end of each plunger contacting with an abutment being convexed and corresponding to the curvature of the abutment.

998,976. Electric Brake. William Ford Moody, Denver, Colo. Filed May 20, 1910. Serial No. 562,551.

1. In a brake, the combination of a brake band for encircling a revoluble member, a rocking lever having its ends connected with the ends of said brake band, a fixed magnetic member, an armature therefor, said armature being free to move toward and from said revoluble member, a frame mounted rigidly upon said armature and movable directly therewith toward and from said revoluble member, said frame being journaled to said lever at a point intermediate the ends of said brake band, and spring mechanism for moving said armature in a direction contrary to the direction in which said armature is attracted by said magnetic member.

998,980. Tire. John J. Patton, New York, N. Y. Filed Jan. 24, 1911. Serial No. 604,311.

1. A wheel tire of the character designated comprising a continuous one piece rolled annular metallic rim shrunk onto the felly of a wheel and consisting of a base plate formed integrally with out-turned side flanges which are recessed on their inner sides to receive the ends of diagonal cap plates, said cap plates, diagonal elastic resilient treads seated on the base plate of the rim between its side flanges and formed with the longitudinal base flanges, and bolts securing the said diagonal cap plates in position overlapping the adjoining longitudinal flanges on the said diagonal treads for the purpose described.

998,993. Carburetting Apparatus. George

Herbert Skinner, Ealing, England. Filed July 13, 1908. Serial No. 443,399.

1. A carburetter for internal combustion engines, comprising a passage leading from the air inlet to the engine cylinder, an air-regulating valve placed with its axis inclined to that of the said passage and so as to normally obstruct the flow of air therethrough, a chamber in which the rear part of said air-regulating valve moves, a valve seating in the aforesaid passage arranged to extend transversely across the front end of said air regulating valve, a fuel supply needle valve carried by said air-regulating valve, a fuel inlet in the valve seating to cooperate with the said needle valve, and means for enabling the suction of the engine to raise the aforesaid air-regulating valve from its seating.

999,016. Friction Clutch. John W. Denmead, Akron, Ohio, assignor of one-half to James Christy, Akron, Ohio. Filed Jan. 18, 1911. Serial No. 603,395.

1. A friction clutch embodying a driving member provided with a seat, a driven shaft, a sleeve fixedly mounted thereon, an arm carried by said sleeve, a circumferential band surrounding said seat and connected with said arm, a rocking lever suitably supported and connected with the loose end of said band, means engaging the free end of said lever and mounted on said sleeve arranged when moved in one direction to rock said lever to tighten said band, and a weight moved by the centrifugal force developed by the revolution of said clutch arranged to assist in contracting said band, in direct ratio to the amount of centrifugal force developed, for effecting clutching relation between said band and seat.

999,022. Spark Plug Attachment. Charles T. Gaither and Louis H. Black, Youngstown, Ohio. Filed Jan. 5, 1911. Serial No. 601,035.

1. A spark plug attachment including a slidably mounted contact rod carried by the head of the spark plug and adapted to be moved into contact with the base thereof to render the spark plug inoperative.

999,027. Transmission Gearing. Christian M. Hansen, Chicago, Ill. Filed July 9, 1910. Serial No. 571,161.

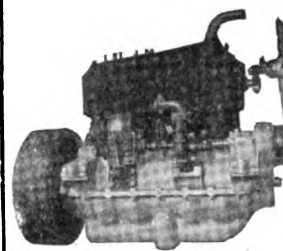
1. A transmission gearing comprising in combination, a driving shaft, a member rotatably rigid therewith, at least one countershaft arranged parallel with said driving shaft, a member rigid with said countershaft, gearing between said countershaft and said driving shaft, a shaft to be driven disposed in axial alignment with said driving shaft, a member rotatably rigid therewith and adapted to be engaged by said respective member on said driving shaft and said countershaft to drive said shaft to be driven at different speeds, and means controlling the engagement of said respective members on said driving shaft and said countershaft with said member on said shaft to be driven whereby only one at a time of said first-named members may be

brought into actuating relation to the last-named members.

999,047. Engine or Motor. George Leiberger, Newark, N. J. Filed Oct. 4, 1909. Serial No. 520,897.

1. In an explosive engine, a casing comprising interchangeable drum sections secured together and provided with integral chambers extending from said drum sections, cylinders projecting from the ends of said chambers, said cylinders being arranged in the same line and connected at their extreme outer ends with bearings, pistons in each cylinder, piston rods connecting the pistons in pairs, a shaft projecting from the casing between the chambers and cylinders, the ends of which are located in said cylinder bearings, a rotative member having a helical groove secured to the shaft

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Ajax-Grieb Rubber Co.	703	Haynes Automobile Co.	721		
American Ball Bearing Co.	718	Henderson Motor Sales Co.	722		
American Motors Co.	720	Hot-Spark Plug Co.	706		
American Starter & Carburetor Mfg. Co.	719	Hupp, R. C.	721		
Argo Electric Vehicle Co.	636	Hupp Motor Car Co.	719		
Atwater-Kent Mfg. Wks.	629	Hyatt Roller Bearing Co.	645		
Automobile Supply Mfg. Co.	720				
B		I		P	
Badger Brass Mfg. Co.	718	Ignition Starter Co.	694-95	Packard Electric Co.	716
Barthel, Daly & Miller	724	Inner Shoe Tire Co.	703	Parish & Bingham Co.	720
Bartholomew Co.	706	International Accessories Corp.	715	Parish Mfg. Co.	708
Bosch Magneto Co.	717	Inter-State Automobile Co.	721	Perfection Spring Co.	708
Bossert Co.	720	Invincible Starter Co.	657	Petrel Motor Car Co.	719
Bower Roller Bearing Co.	649			Pierce-Arrow Motor Car Co.	F. C.
Bretz, J. S., Co.	709			Pullman Motor Car Co.	719
Briggs-Detroit Co.	706				
Briggs & Stratton Co.	640				
Briscoe Mfg. Co.	714				
Brown-Lipe Gear Chapin Co.	716				
Brush Runabout Co.	646				
Bush Mfg. Co.	707				
C		J		R	
Cartercar Co.	641	Jackson Automobile Co.	722	Remy Electric Co.	717
Century Electric Car Co.	706	Jamestown Wheel & Mfg. Co.	708	R. I. V. Co.	707
Champion Ignition Co.	717	Jeffery-DeWitt Co.	654	Royal Equipment Co.	718
Champion Spark Plug Co.	718	Jeffery, Thomas B., Co.	721		
Clark-Carter Automobile Co.	721	Jones, Phineas, & Co.	719		
Classified Advertising	705	Jones Speedometer	716		
Colby Motor Car Co.	722				
Colonial Electric Car Co.	706				
Continental Motor Mfg. Co.	703				
Corbin Motor Vehicle Co.	722				
Covert Motor Vehicle Co.	644				
Cramp, Wm. & Sons, Ship & Engine Building Co.	716				
Crosby Company	720				
D		K		S	
Dayton Engineering Laboratories	627	Kellom, Chas. F., & Co.	709	Sackman Mfg. Co.	712
Dayton Motor Car Co.	646	Kelly-Springfield Tire Co.	702	Safety Tire Gauge Co.	708
Dayton Rubber Mfg. Co.	708	Kinsey Mfg. Co.	711	Salisbury Wheel & Mfg. Co.	718
Dean Electric Co.	624	Kissel Motor Car Co.	648	Sampson, Alden Mfg. Co.	646
Diamond Chain & Mfg. Co.	714	Kline Motor Car Corp.	724	Schrader's Son, A., Inc.	713
Diamond Rubber Co.	642	Knox Automobile Co.	722	Selden Motor Vehicle Co.	724
E		L		Shawmut Tire Co.	703
Electric Welding Products Co.	720	Lauth-Juergens Motor Car Co.	711	Sparks-Withington Co.	633
Empire Tire Co.	720	Leather Tire Goods Co.	723	Speedwell Motor Car Co.	721
F		Leognard Bros.	713	Splitdorf, C. F.	712
Fedders Mfg. Co.	715	Locomobile Company	703	Springfield Metal Body Co.	708
F. I. A. T.	622	Lovell-McConnell Mfg. Co.	Inside B. C.	Standard Roller Bearing Co.	708
Firestone Tire & Rubber Co.	706			Standard Oil Co.	709
Fisk Rubber Co.	623			Standard Tire Protector Co.	708
Ford Motor Co.	652			Standard Welding Co.	659
G		M		Stearns, F. B., Co.	721
Goodyear Tire & Rubber Co.	637	Mais Motor Truck Co.	719	Stewart & Clark Mfg. Co.	638
Gray & Davis	656	Marion Sales Co.	722	Streator Motor Car Co.	655
Grossman, Emil, Co.	716	Maxwell-Briscoe Motor Car Co.	646	Stromberg Motor Devices Co.	625
		Mayo Radiator Co.	623	Studebaker Corp.	628
		McIntyre, W. H., Co.	719		
		Metz Co.	722		
		Metzger Motor Car Co.	626		
		Michelin Tire Co.	716		
		Michigan Buggy Co.	643		
		Michigan Crank Shaft Co.	708		
		Miller, Chas. E.	634-35		
		Mosler, A. R., & Co.	708		
		Moss Photo Engraving Co.	710		
		Motor Car Equipment Co.	708		
		Motor Wagon Co. of Detroit	650		
		Mott Wheel Works	724		
		Motz Tire & Rubber Co.	707		
		N			
		National-Acme Mfg. Co.	709		
		National Motor Vehicle Co.	718		
		New Departure Mfg. Co.	651		
		Nordyke & Marmon	632		
		Not-A-Crank Gas Engine Starter Co.	706		
		T			
		Thomas, E. R., Motor Car Co.	708		
		Timken-Detroit Axle Co.	639		
		U			
		Union Sales Co.	719		
		United Rim Co.	658		
		U. S. Auto Horn Co.	718		
		United States Motor Co.	646		
		United States Tire Co.	Inside Cover-621		
		V			
		Velie Motor Vehicle Co.	718		
		W			
		Warner Gear Co.	716		
		Warner Instrument Co.	717		
		Weed Chain Tire Grip Co.	708		
		Western Motor Co.	724		
		Weston-Mott Co.	630-31		
		Wetherill Finished Castings Co.	724		
		Willys-Garford Sales Co.	B. C.		
		Willys-Overland Co.	660		
		Winton Motor Car Co.	721		
		Wisconsin Motor Mfg. Co.	706		

and located in the drum sections, and means secured to the piston rod and in engagement with said rotative member.

999,085. Method of Forming Tire-Rims. Bert C. Ball, Portland, Ore. Filed July 7, 1910. Serial No. 570,860.

1. The method or process of forming tire rims separately circumferentially with edges adapted to overlap, which consists in forming a ring having two parallel annular surfaces, one outside and one inside the

ring, of a diameter and shape to form the overlapping edges on the two rim parts, and then severing the ring between the surfaces.

999,086 Demountable Tire Rim. Bert C. Ball, Portland, Ore. Filed July 7, 1910. Serial No. 570,861.

1. In a demountable rim, the combination of a two part rim separated circumferentially, each part having an annular undercut shoulder on its inner periphery; a

locking ring separated transversely, and having annular undercut shoulders to receive the undercut shoulders of the rim; and means for securing the locking ring on the wheel.

999,125. Adjusting Mechanism for the Lamps of Automobiles. Russell H. Sphar and Edward Ostermier, Charleroi, Pa. Filed May 19, 1911. Serial No. 628,211.

In an adjusting mechanism for the lamps of automobiles, the combination with side

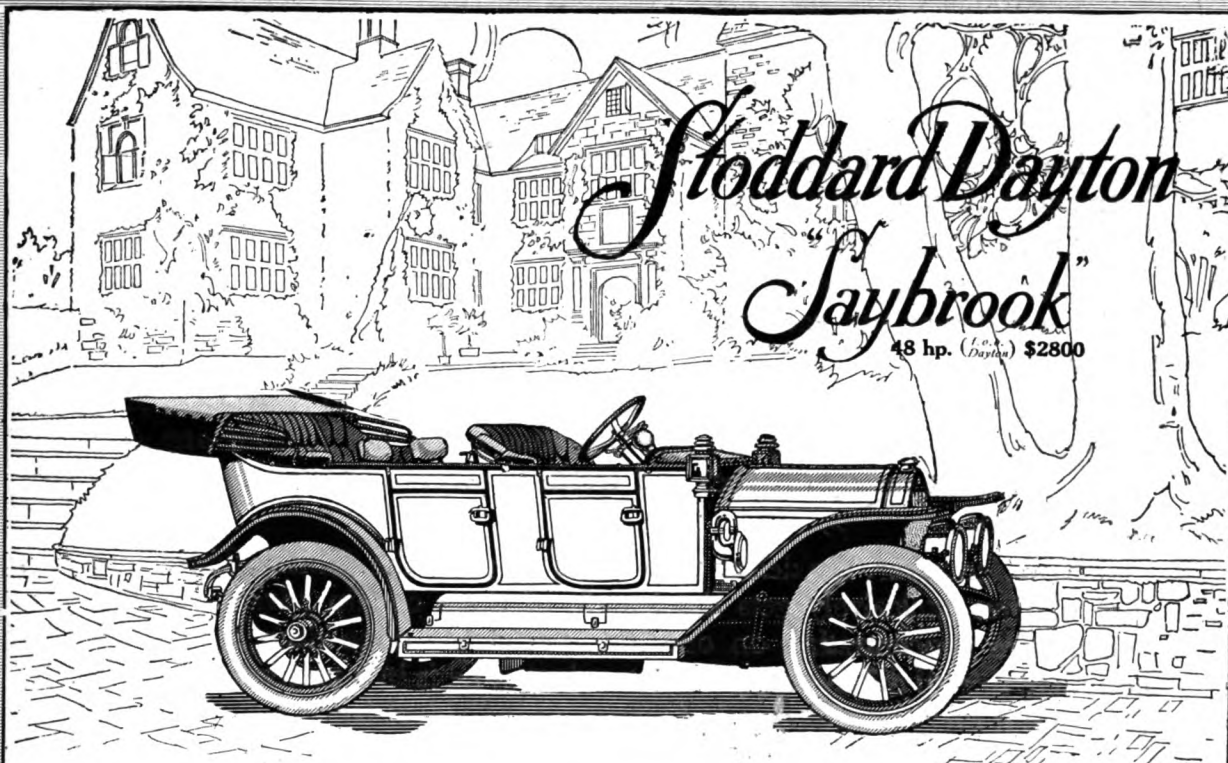
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 7

New York, February 8, 1912

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"Saybrook"
48 hp. (Dayton) \$2800

THE Stoddard-Dayton "Saybrook" Touring Car was designed with a fine eye to comfort. You must be comfortable in your motor car to get the full joy of motoring.

You can move the driving seat backward or forward—it is adjustable to your length of limb.

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In the tonneau five passengers won't crowd each other in the least. The seats are extra wide.

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Springs, 2½ inches wide—three-quarter elliptic rear—well-arched and scientifically suspended.

Wheelbase, 122½ ins., the right length for easy riding. Deeply-cushioned upholstery, with seat backs at just the right angle. Nothing on the running-boards to interfere with easy entrance and exit.

Body set on rubber cushions, eliminating vibrations. Shock absorbers are part of the equipment, of course.

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The dealer who pushes exclusively one line that he can conscientiously recommend to his customers, and which will back up his recommendation with genuine good quality, is on the right road to a permanent and profitable business.

He talks one line—advertises one line and converts his trade into permanent users of one line.

All of which gives him a decided advantage over the dealer who furnishes “any tire desired” and who usually finds that his customers desire a different tire each time they purchase, and very often a different dealer as well.

Heretofore many dealers have found it impractical to follow this plan of concentrating owing to the fact that they could not find in any one line a sufficient variety of types and treads to meet their customers' varied requirements.

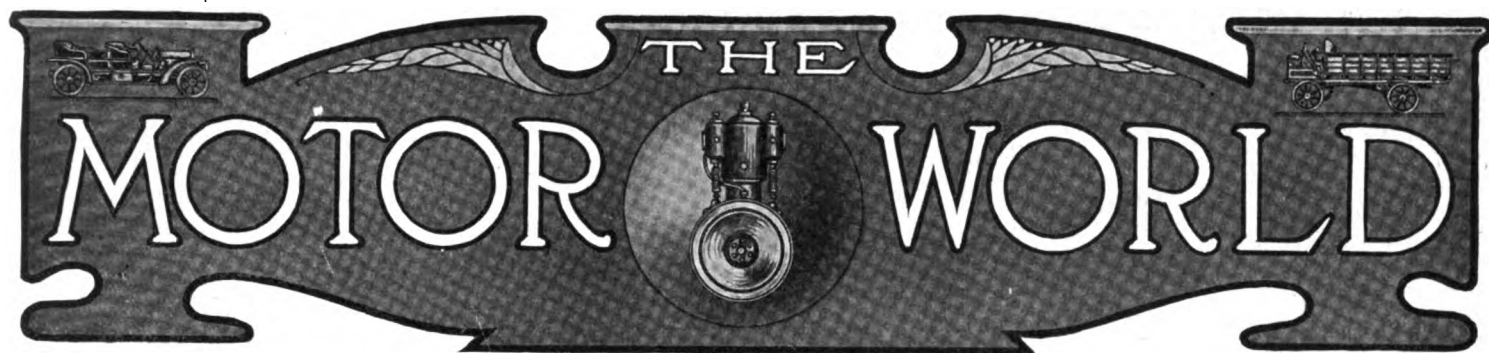
Now, however, the dealer who elects to push the United States Tire line of tires exclusively gets the benefit of these certain advantages that come from concentrating on one line, yet at the same time has such a complete line of different types and treads that he is in a position to supply tires to suit every possible kind of service or individual fancy.

The United States Tire line is undoubtedly the most complete in the world. It comprises six types of treads—Round, Nobby, Bailey, Type Course, Steel Stud and Chain, each made in three types—Clincher, Dunlop and Quick Detachable (Round Tread made in either Wrapped Tread or full moulded type)—the finest Special Electric Tire in the world made in Round and Nobby Treads, and a full line of sundries and repair materials which for completeness and quality has never been duplicated.

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But Does Not Know When Studebaker Will Release Him—One More Step in a Remarkable Situation.

It now is beyond question that Walter E. Flanders has tendered his resignation as a vice-president of the Studebaker Corporation and as general manager of its automobile division.

Flanders himself threw off all evasion and admitted the fact to a Motor World man in Detroit yesterday (Wednesday). He also admitted that he did not know when the directors of the company would accept his resignation and release him, but he added that he was anxious to get out as soon as possible in order to devote himself to his own Flanders Mfg. Co., in Pontiac, Mich., which requires his attention and all his energies. Flanders, however, is bound to the Studebaker Corporation by a contract, which still has some time to run, and as the Studebaker officials have not been wholly blind to the manner in which affairs have been shaped during the past six months, it is not improbable that they will be in no hurry to accept the resignation. When Flanders goes, or before he goes, it is not likely that he will lack company.

That he has resigned scarcely will excite much surprise. Some six months ago it became known in inner circles that he would "quit Studebaker somehow" and was laying plans accordingly. The date was set for "soon after January 1st," and it was with full knowledge of the fact, that the Motor World several weeks ago gave Flanders an opportunity to deny that he had resigned or intended to resign. He made a fortune overnight when the Studebaker Corporation purchased the E-M-F Co. after a memorable legal fight and he has had other ore-bearing irons in the fire ever since. Given an almost free hand, his name has been adroitly exploited in the Studebaker advertising and publicity matter and at Studebaker expense until his

name has been made known in the four corners, and where the name Studebaker has followed only as a rather insignificant trailer, thus advancing his own interests enormously—and with the end not wholly in sight.

The situation has had some remarkable phases and has been filled with interesting possibilities and probabilities, which may or may not be hastened by Flanders's formal resignation.

Hupp Corporation Changes Its Title.

Following the settlement of the dispute over the right to the name Hupp, and in accordance with one of the provisions of the settlement, the Hupp Corporation, of Detroit, has changed its title to the R. C. H. Corporation, taking the name from its car and from the initials of its head, R. C. Hupp. Concurrently the capital of the corporation has been increased from \$800,000 to \$1,000,000, the increase all being preferred shares which were at once taken up by stockholders of the present company. It is stated that plans already in hand will permit an output of 10,000 R. C. H. gasoline cars and 1,000 Hupp-Yeats electric cars and trucks during the current year.

Brooklyn Dealers Sue for \$150,000.

Claiming to have been damaged to the extent of \$150,000 by alleged non-fulfilment of an agency contract, the Cody Motors Co., of Brooklyn, N. Y., has instituted suit in the New York Supreme Court against the Warren Motor Car Co., of Detroit, Mich. The latter, however, has questioned the jurisdiction of the State court and has moved that the case be transferred to the Federal court, and this motion is pending, and as it will not be opposed by the complainants the motion almost certainly will be granted.

White London Company Incorporated.

The White Co. (London) Ltd., has been registered under British laws with £35,000 capital, in £1 shares, to take over the business of The White Co. in London. F. A. Coleman is named as the first director of the English company.

WILBURINE "GOES FOR" WOLVERINE

Legal Friction Caused by Names Applied to Lubricants—Wilburine Asks for an Injunction and Rival's Labels.

Whether or not the names "Wilburine" and "Wolverine" as applied to two well-known brands of lubricants are so nearly alike as to cause confusion in the minds of the public and intending customers and to divert the dollars which were intended for the Wilburine Oil Works, Ltd., of Warren, Pa., into the treasury of the Wolverine Lubricants Co., of New York City, shortly will be decided by the United States District Court for the Southern District of New York. At any rate, a suit having that end in view and asking for an injunction and redress has been filed in that court against the Wolverine concern by the Wilburine company, in which the latter charges the Wolverine company with "imitation and unfair competition, by fraudulently substituting goods of its own manufacture, with the intention of deceiving the public."

According to the bill of complaint the Wilburine Oil Works, Ltd., was formed in 1898, and for the purpose of readily identifying its goods adopted the trade name "Wilburine" for all its products, consisting of lubricating oils, greases and other petroleum manufactures. This name was entered in the patent office as a trade mark on May 1, 1906, under the number 51,121. Later, the Wolverine Lubricants Co. was organized under the laws of New York to deal in the same class of goods as the Wilburine company, and the complaint charges that this adoption of the word "Wolverine" was made with the "intention of deceiving the public"; that it has resulted in great confusion in the trade; that orders have been lost, and that many intending purchasers, including Wilburine customers, have ordered Wolverine goods under the impression that they were receiving the products of the Wilburine company. It recites furthermore, that the fact of both

companies having offices in New York City made confusion worse confounded, and that the Wilburine Oil Works has been damaged to the extent of at least \$25,000 in lost orders and profits.

The plaintiff asks not only for an injunction preventing the use of the name Wolverine on the products of the company, but also the employment of the incorporated name "Wolverine Lubricants Co." or "any other name so nearly alike 'Wilburine';" it furthermore asks that the Wolverine company be required to turn over to the Wilburine concern all wrappers, packages, cans, tags, labels and other matter bearing the printed name "Wolverine."

Stoddard and Edwards In New Project.

C. G. Stoddard, who last week resigned the first vice-presidency of the United States Motor Co., has joined hands with H. J. Edwards, chief engineer of the company, who tendered his resignation a few days before, and together it is their purpose to organize a new company which probably will be styled the Edwards Motor Car Co., but just where they will locate is uncertain. Both men were officials of the Dayton Motor Car Co. before it was taken into the United States Motor Co., and while it was known that Edwards and his family were not enamored of residence in New York, as Stoddard had removed his home too, and, apparently was content, it is not denied that his present action caused more or less of a surprise. It is understood, however, that an opportunity which presented itself to secure a license to use the Knight sleeve-valve engine afforded such great possibilities that it could not be resisted. Late last week, Stoddard and Edwards were in Indianapolis, where, if support is forthcoming, their plant will be located. Several considerable sums were pledged, but they let it be known that they will not begin business with less than \$750,000.

Cameron Finally Forced to the Wall.

The effort of the Cameron Car Co., of Beverley, Mass., to prevent itself being declared bankrupt have proved unavailing, Judge Dodge, in the United States District Court, in Boston, last week, having formally adjudicated the company bankrupt. According to its schedules, which were filed on Thursday, its liabilities amount to \$209,346. The Cameron company never was very large or very conspicuous, but nevertheless was able to interest capital in Attica, Ohio, where for a year or so it operated a branch factory.

Consolidated Becomes Kelly-Springfield.

The name of its tire having become better known than the name of the company itself, the Consolidated Rubber Tire Co., has changed its name to the Kelly-Springfield Tire Co. The change, however, is one of name only, the officers and addresses remaining as heretofore.

ENGLISH EXPORTS GAIN 23 PER CENT.

Year's Total Close to \$16,000,000—Average Values Rule Higher—Imports Amount to Nearly \$30,000,000.

Despite the increase in the number of cars manufactured in Great Britain, the statistics issued by the British government show that foreign-made cars still find a ready market in the British isles and that the export of English-made automobiles, while growing, is far behind the import of foreign cars. During the twelve months of 1911, there were exported from Great Britain 4,539 complete cars, valued at \$9,025,126; 733 chassis, values at \$1,476,446, and parts valued at \$5,427,015—a total of \$15,928,585.

In the preceding year the exports amounted to 3,555 complete cars, valued at \$6,884,430; 564 chassis, valued at \$1,067,680, and parts to the value of \$5,076,525—a total of \$13,027,635, representing a gain of \$2,900,950, or 23 per cent. For the month of December alone the export figures show that 464 complete cars, valued at \$904,105; 80 chassis, valued at \$154,380, and parts valued at \$429,825, were sent abroad—a total of \$1,488,310 worth of manufactures. These figures indicate slight gains over the same month of the preceding year, 1910.

Large as are these exports, they are only a little more than one-half of the imports of foreign-made cars, chassis and parts, the total figures for the year 1911 being: 6,778 cars, valued at \$8,589,915; 6,672 chassis, valued at \$8,619,445, and parts valued at \$12,766,820—a total of \$29,976,180. For the year 1910 the respective figures were: 4,576 complete cars (\$7,199,810); 6,553 chassis (\$8,357,965), and parts (\$10,116,365)—a total of \$25,574,140; the 1911 imports representing a gain of \$4,402,040, or 17 per cent., over those of 1910.

The average value of cars imported in 1911 figures out at \$1,988, and that of the chassis, \$2,014, as against \$1,837 and \$1,899, respectively, in 1910. The average value of imported cars in 1911 amounted to \$1,267, and that of the chassis to \$1,292, as against \$1,573 and \$1,275, respectively, in 1910.

Nyberg Secures Factory in Chattanooga.

Henry Nyberg, proprietor of the Nyberg Auto Works, of Anderson, Ind., who has been touring the South with a view of locating a factory in that part of the country finally has made the necessary connection in Chattanooga, Tenn., where he has organized the Nyberg Auto Works under the laws of that State, with \$150,000 capital stock. He already has secured the necessary factory building, a two-story structure 50 x 200 feet, located near the intersection of Main street and Dobbs avenue and part of the equipment of the Anderson

plant will be transferred to Chattanooga, and as soon as it is installed actual operations will begin. The Nyberg cars made in Tennessee will be duplicates of those produced in Indiana. Among the Chattanoogaans who are interested in the project are J. A. Patten, Z. C. Patten, Jr., G. H. Miller, Frank Miller, C. E. James and F. H. Dowler. As not all of the stock has been disposed of, it is expected that other residents of Chattanooga will lend a hand.

Syndicate Takes \$8,000,000 Case Stock.

Following the recent increase of capital stock from \$5,000,000 to \$40,000,000, the J. I. Case Threshing Machine Co., of Racine, Wis., has sold \$8,000,000 of its new 7 per cent. preferred stock to a syndicate which, it is stated, is headed by J. P. Morgan & Co., and which stock shortly will be offered for public subscription at par. It transpires that \$4,000,000 of the new 7 per cent. stock was exchanged on January 2 last for old 5 per cent. cumulative shares.

From the proceeds of the new issue of preferred stock the \$2,300,000 bonds of the Case company will be retired May 1 next, as well as its floating debt, so that the company will then have only stock outstanding consisting of \$12,000,000 preferred and \$8,000,000 common. It is also proposed to spend about \$1,200,000 from the sale of the new stock for improvements and extensions of the company's plant. The stock will be placed in the hands of a voting trust for a period of three years, the trustees being Frank K. Bull, of Racine, Wis.; Francis L. Hine, president of the First National Bank of New York, and William E. Black, of Milwaukee. Messrs. Hine and Black, together with Thomas W. Lamont, Alexander M. White and E. I. White were elected directors of the Case company at the time its capital was increased to \$40,000,000 in December last.

Bennett Seeks His Voice in Florida.

Because of paralysis of his vocal chords, George W. Bennett, vice-president and general sales manager of the Willys-Overland Co., of Toledo, has been forced to relinquish his duties and seek the benefits of the climate of Florida. For several weeks Bennett's throat has been in bad shape and when he left the New York show, and since then, he barely has been able to speak in whispers, when he has been able to speak at all. Their treatment failing to relieve his ailment, which, if anything, grew worse instead of better, the Toledo physicians advised that Bennett go South where they think the warmer climate will effect a cure.

U. S. Motor Passes February Dividend.

At a deferred meeting of the directors, held yesterday in Jersey City, the United States Motor Co. passed its regular quarterly dividend of 1¼ per cent. due on the preferred stock in February. The directors deemed it wise to retain the money in the treasury to meet current needs.

YEAR'S EXPORTS TOTAL \$19,178,484

Increase Amounts to 45 Per Cent.—Canada Still Heaviest Buyer But Statistics Disclose Some Amazing Shifts and Reductions of Average Values.

In its endeavor to boost the 1911 exports of American automobiles above the \$20,000,000 mark, the Department of Commerce and Labor last week gave out advance information which achieved that result only by including shipments made to Hawaii, Porto Rico and Alaska, as well as tires, the exports of the latter alone amounting to nearly \$2,500,000. The actual figures, as contained in the summary of imports and exports, show that during the year 1911 there were exported to foreign countries 15,807 cars, valued at \$15,924,361, as compared with 8,443 cars, valued at \$11,210,295, in the preceding year, an increase of 87 per cent. in number and 42 per cent. in value. During the same period \$3,254,123 worth of parts were exported, as against \$1,980,001 worth in the twelve months of 1910, representing a gain of 65 per cent. The aggregate of cars and parts amounted to \$19,178,484, as compared with \$13,190,296 during 1910, a gain of 45 per cent. The average value of the exported cars showed a decline from \$1,327 in 1910 to \$1,008 in 1911.

The gains made during the twelve months of 1911 aggregate \$4,714,066, a sum almost equal to the entire automobile exports of 1908; but, although gratifyingly large in themselves, these gains do not reach the high record made in 1910, when the increase over the previous year amounted to \$5,403,679. Furthermore these gains, which in 1910 extended to every one of the twelve geographical divisions (with the sole exception of a small loss in France), during 1911 concentrated upon six of the divisions, the six others registering substantial losses. With the exception of Great Britain every European country took a smaller number of American cars, while even Mexico and the West Indies reduced their purchases. Canada, too, which in 1910

increased its purchases by over 100 per cent. (or \$2,580,000), did not keep up its long continued heavy gains, but took only 10 per cent more in cars and parts than in the preceding year, the figures being \$5,021,043 and \$5,549,998, respectively. But despite the losses in countries where increases were recorded last year, the extraordinary gains made by South America and British Oceania turned the tide in America's favor and caused the total exports to show a satisfactory percentage of increase over the figures of 1910.

South America, which during the year 1910 increased its purchases by 100 per cent. over those of the preceding year, continued this remarkable gain during the twelve months of 1911, finishing the year with a total of 1,116 cars, valued at \$1,356,445, as compared with \$519,160 worth of cars and parts in the previous year, an increase of fully 161 per cent. Still more striking are the gains registered by British Oceania, which not only showed the greatest proportional increase, but also the greatest actual gain made by any country or division—a position which for several years had been held by Canada. No less than 2,476 cars, valued at \$2,217,762, were sent to that division during 1911, a gain of \$1,468,829, or 196 per cent., over the figures of the preceding twelvemonth.

Even more remarkable than the export figures for the year 1911 as a whole, are the figures for December of that year, compared with the same month of the preceding year. During the month of December, 1911, 2,247 cars, valued at \$1,933,430, were exported, representing a gain of 1,490 cars (198 per cent.), valued at \$1,063,040 (122 per cent.), over the quantities sent abroad in the same month of 1910. The average price of exported cars, according to this table, therefore, fell to \$860.50 during the year 1911, having stood at \$1,149 for the month of December, 1910. More than one-third of the total number of cars sent abroad during this month went to the United Kingdom, the figures being 858 cars, valued at \$638,742, as compared with \$116,288 worth of cars and parts in December, 1910, a gain of more than 450 per cent. The record for the month of December furthermore shows that the average value of cars

exported to Mexico was \$1,683, while that of the cars sent to Germany was only \$656—these two representing the highest and lowest average prices obtained.

Great Britain heads the list of buyers of American cars with \$638,742, followed by Canada (\$412,313), British Oceania (246,046), South America (\$225,263), Asia and Other Oceania (\$76,492), and Other Europe (\$67,718), in the order named. The table in detail is appended below.

Tire Exports for Twelve Months, \$2,458,000.

During the month of December, 1911, automobile tires valued at \$200,450 were exported from this country, as compared with \$144,645 worth in the same month of the preceding year. For the full year of 1911 the value of exported tires is given at \$2,458,177, no comparison with the preceding year's figures being available as the government did not list automobile tires separately previous to July 1, 1910. For the purposes of comparison, however, the figures for the second halves of the two years are given here, obtained by addition of the individual months of July-December, inclusive: There were exported in the period of July 1 to December 31, 1911, tires valued at \$1,213,000, as against \$869,930 worth in the latter half of 1910.

1,694 Gasolene Engines Exported in 1911.

Exports of internal combustion motors for use in automobiles steadily are assuming greater importance. During the six months from July 1 to December 31, 1911, there were sent abroad 1,694 automobile motors of the gasolene type, valued at \$204,809, while during the month of December alone 448 motors, valued at \$58,236, were shipped from this country. No figures are available for comparison with a similar period previous to July 1, 1911.

McCue Dissolved in Connecticut.

The McCue Co., of Hartford, last week filed its certificate of final dissolution with the Secretary of the State of Connecticut. Several months since the company removed from Hartford to Buffalo, N. Y., where it is very much alive. The dissolution of the Connecticut corporation is merely a matter of form.

	December—		1911		Twelve months ending December—		
	1910		1911		1910	1911	
Automobiles, and Parts of—	Value	No. Cars	Value		Value	No. Cars	Value
Automobiles	\$870,390	2,247	\$1,933,430		\$6,889,031	15,807	\$15,924,361
Parts of (except tires)	175,565		302,935		897,586		3,254,123
Exported to—							
United Kingdom	116,288	858	638,742	2,059,210	2,755,592	4,021	3,380,266
France	33,677	35	24,043	846,136	753,204	420	449,757
Germany	1,625	9	5,905	181,087	331,754	115	126,615
Italy	12,635	5	5,202	224,068	377,750	176	199,986
Other Europe	19,918	90	67,718	335,675	764,463	795	718,360
Canada	339,945	431	412,313	2,437,042	5,021,043	4,987	5,549,998
Mexico	52,323	36	60,658	494,238	689,903	298	492,974
West Indies and Bermuda	58,873	37	39,847	337,414	412,588	300	343,281
South America	73,567	207	225,263	240,453	519,160	1,116	1,356,445
British Oceania	200,536	435	346,046	303,452	748,933	2,476	2,217,762
Asia and other Oceania	114,592	71	76,493	191,448	599,756	813	795,576
Other countries	21,976	33	31,200	136,394	216,150	280	295,341
Total	\$1,045,955		\$2,236,365	\$7,786,617	\$13,190,296		\$19,178,484

IMPORTS SHOW A SMALL NET LOSS

Cars Held Their Own During 1911 But Parts Were Cut in Half—Remarkable Strength in December.

While exports of American automobiles have been increasing in leaps and bounds during the year ending December, 1911, imports of foreign-built machines into the United States have barely held their own—the figures showing that 972 cars, valued at \$2,098,481, were brought to this country in 1911, as against 1,024 cars, valued at \$2,080,555, in the preceding year. The average value of the imported car, therefore, has risen from \$2,032 to \$2,159. These figures only include complete cars and chassis and do not take into account \$347,767 worth of parts, which were sent to this country, as against \$656,653 worth in 1910—a loss of 48 per cent. The aggregate figures for both cars and parts are \$2,446,248 in 1911, as against \$2,737,208 in 1910, a net loss of \$290,960, or about 11 per cent.

France's sales fell off to the extent of 215 cars, valued at \$295,713, while Italy's loss amounted to 38 cars, valued at \$108,745. Germany, which during the twelve months of 1910 sent 129 cars, valued at \$314,577, to this country, increased its sales to 160 cars, valued at \$350,239. Great Britain, however, made a better showing, its sales increasing by over 95 per cent., the figures for the two years being 94 cars, valued at \$212,969, and 173 cars valued at \$403,506, respectively. The division Other Countries registered the heaviest gains, both actually and proportionately, its sales rising from 76 cars, valued at \$174,175, to 167 cars, valued at \$370,360—a gain of \$196,185, or 112 per cent. Arranged in the order of their importance to the American motorist, the list of importing countries still is headed by France with \$770,643; United Kingdom is second with \$403,506; Other Countries third, with \$370,360; Germany fourth, with \$350,239, and Italy last, with \$203,733.

The figures for the month of December, 1911, hold out more promises to the importers—every one of the five divisions increasing its sales, both in the number of cars and in their value. Parts also gained to the extent of nearly 95 per cent., or from \$25,830 worth in 1910 to \$50,325 in 1911. The report in detail is as follows:

	December 1910		December 1911		Twelve months ending December 1909		Twelve months ending December 1910		Twelve months ending December 1911	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Automobiles, and Parts of—										
Automobiles	83	\$178,900	103	\$227,067	1,645	\$3,071,062	1,024	\$2,080,555	972	\$2,098,481
Parts of (except tires)...		25,830		50,325		865,506		656,653		347,767
Imported from—										
United Kingdom	15	25,501	23	50,823	101	233,383	94	212,969	173	403,506
France	46	101,688	47	108,687	928	1,670,900	556	1,066,356	341	770,643
Germany	10	25,401	13	28,086	127	321,033	129	314,577	160	350,239
Italy	8	14,121	13	21,648	418	689,454	169	312,478	131	203,733
Other countries	4	12,189	7	17,823	71	156,232	76	174,175	167	370,360
Total automobiles, and parts of		\$204,730		\$277,392		\$3,936,508		\$2,737,208		\$2,446,248

Ford to Locate Warehouse in Los Angeles.

James Couzens, secretary and treasurer of the Ford Motor Co., of Detroit, is now on the Pacific coast and practically has consummated arrangements for the establishment of a Pacific coast depot in Los Angeles. The Ford company already has a branch in that city and the new building which is in view will be not merely a sales-room but a large repository or warehouse from which the entire Pacific coast trade will be supplied. Knowledge that such action was in view led to the circulation of reports that the Ford people intended establishing an assembling plant on the coast but such reports are merely "hot air."

Newton Increases Capital to \$500,000.

The Automobile Supply Manufacturing Co., of Brooklyn, N. Y., has increased its capital stock to \$500,000. The new money will be used to still further enlarge its plant, which several times has been increased during the past two years. Although the Automobile Supply Manufacturing Co. is best known because of its Newton electric horn, it is a large producer of bulb horns also; in fact, the principals of the company claim that theirs is the largest plant in the United States producing bulb horns.

Kellogg Pumps in the Two Big Cities.

The Kellogg Mfg. Co., of Rochester, N. Y., last week opened branches in both New York and Chicago. In the former city the establishment is located at 1773 Broadway, and is in charge of S. B. Leson; in Chicago the branch, which is in charge of E. B. Reeser, is situated at 1108 South Michigan avenue. In both places full stocks of the Kellogg pumps will be carried.

Kelly-Springfield Acquires a Branch.

The Seneca Rubber Co., of Buffalo, N. Y., has been taken over by the Kelly-Springfield Tire Co., and the business at 921 Main street hereafter will be conducted as a Kelly-Springfield branch. It will be in charge of William Q. Cramp, one of the owners of the Seneca company.

Wallerich Leaves Mais Motor Truck.

C. H. Wallerich, sales manager for the Mais Motor Truck Co., of Indianapolis, has resigned that office to assume the management of the automobile department of the newly organized General Industrial and Manufacturing Co., of Indianapolis. Light delivery wagons will be the chief products.

SEEKS TO AMEND THE PATENT LAW

Congressman Offers Bill to Prevent Seldene-like Situations—Also Would Kill "Un-worked" Patents in Three Years.

In an effort to remove some of the more flagrant abuses growing out of the patent system at present in vogue in this country, Mr. Thayer, of Massachusetts, has introduced into the House of Representatives a bill, which, if enacted, will go far toward serving that purpose. Mr. Thayer's bill is short and to the point.

The first section provides that when patents are issued they shall date back to the time the application was filed, except that in case of interference they shall date from the time of the settlement of the interference, if such settlement shall be effected within two years of the date of the application; otherwise at the end of two years.

This provision is designed to prevent prolonging the life of a patent beyond the legal limit of seventeen years from the date of its issue and thereby prevent such conditions as arose in connection with the famous Selden patent.

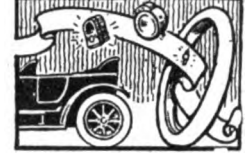
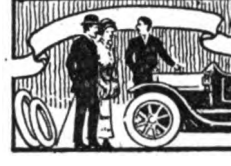
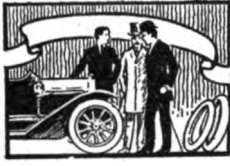
The second section of Mr. Thayer's bill provides that patents shall be annulled unless within three years of the date of their issue the patented articles shall be "put on the market in sufficient quantity, whether by sale, lease or license, to satisfy the reasonable demand of the public and at reasonable prices," which language suggests that the courts will have further opportunity for defining the word "reasonable."

Aristos Takes Over Palmer's Business.

The Aristos Co., of New York, has taken over the business of J. H. Palmer, who handled the Aristos line of Mondex shock preventers and Mondex mufflers, and also the Disco engine-starter in Chicago. The business will hereafter be conducted as an Aristos branch at 1501-05 Michigan boulevard, with Palmer as its manager.

"Six" Added to the Halladay Line.

Having emerged triumphantly from its troubles, the Streator Motor Car Co., of Streator, Ill., maker of the Halladay car, has added a six-cylinder model to its line. It will employ the new Rutenber 50-horsepower engine and will list at \$3,000.



Arthur Downey has opened a garage at Washta, Ia.

Joseph Devine is building a garage in Hastings, N. Y.

J. A. McCondra has purchased the Arizona Auto Co., of Phoenix, Ariz.

J. H. Gerrins has opened a garage on Upper Main street, Petaluma, Cal.

J. M. Tremain is building a garage at Susanville, Cal.; it will be 42 x 140 feet.

Charles Corall has opened a garage and machine shop at the corner of Ninth and I streets, Colton, Cal.

Dr. E. H. Levering & Son have opened a salesroom in Stroudsburg, Pa. They handle the Mitchell line.

A. G. McIntosh is building a one-story brick garage at 6407 Ashland avenue, Chicago, Ill., at a cost of \$8,000.

H. O. Heath, of George's Mills, N. H., has purchased a garage at Newport, R. I., and will shortly take possession.

John E. Brown has purchased three lots on North Covington street, Plainview, Texas, on which to erect a garage.

C. P. Hoggatt is making ready to open a garage and salesroom at Champaign, Ill. He has the agency for Mitchell cars.

D. McLean, of Denver, Col., has entered the automobile business and opened a garage and salesroom at Bisbee, Ariz.

W. H. Kendrick is manager of a new garage which has been opened in Washington, D. C. It is located at 3295 M street, N. W.

C. B. Snyder has opened a salesroom at 607 Sprague avenue, Spokane, Wash., where he will sell Cole and Paterson cars.

The Consolidated Rubber Tire Co., 1110 South Main street, Los Angeles, Cal., has changed its name to Kelly-Springfield Tire Co.

L. Hopfinger & Co. have opened a garage and renting business at Milwaukee, Wis. They are located at 14 North Fond du Lac avenue.

The Merrill-Stevens Co., of Jacksonville, Fla., has added automobiles to its other business and has taken the agency for Carters.

Otto Newman is building a salesroom adjoining the Garrett building, Danville, Ill., where he will display Abbott-Detroit and Premier cars.

Bert Lippold has acquired Gottfried Aga's interest in the Colton Auto & Supply Co., of Colton, S. D. Aga has retired from the firm.

The Westcott Motor Car Co. has been organized at Little Rock, Ark., and has leased the second and third floors of the

Bowser building on Main street. H. M. Westcott is the president of the new company.

John Mathias is preparing to build a two-story brick garage and salesroom at 1002 Pike street, Seattle, Wash., which will cost, when complete, \$25,000.

G. C. Chase and H. M. Miller have formed the Santa Monica Auto Station and opened a salesroom and garage on Oregon avenue, Santa Monica, Cal.

E. F. Aylward and L. H. Phillips, of Livermore, Cal., have purchased a site on East First street, on which they will erect a fire-proof garage, 43 x 120 feet.

The Fairchild-Baldwin Co., of Newark, N. J., has broken ground for a brick garage at 28-38 Halsey street. The building will be 93 x 113 feet and will cost \$18,000.

Contracts have been let for the construction of a new building for the G. W. Hawkins Co., in Houston, Tex. It is located at the corner of Main street and Dallas avenue.

The E. E. Loving Auto Co., of Memphis, Tenn., has opened a new salesroom and garage at 289 Court avenue, with room for 50 cars. Cole cars are handled by the concern.

Edward J. Malley and John Hester have leased a building at the corner of Warren and North Third streets, Hudson, N. Y., and will establish therein a garage and salesroom.

The Leon T. Shettler Co., of Los Angeles, Cal., has found its old quarters inadequate and is building a new garage at Pico and Main streets. It will be ready for occupancy March 1.

The Prudential Tire Co. has been formed at Los Angeles, Cal., for the sale of Prudential tires, which are a new local product. A salesroom has been opened at the corner of Pico and Olive streets.

The Scott County Mercantile Co., of Rock Island, Ill., has purchased the business of the Buck Auto Carriage & Implement Co., at Fourth and Ripley streets, for a consideration of \$15,000.

The E-M-F-Omaha Co. has changed its name to the Studebaker Corporation of America, Omaha Branch. It is expected that all other branches of the sort shortly will alter their titles accordingly.

The Bond Motor Co., of Kansas City, Mo., is erecting a three-story brick building, 50 x 135 feet, on "automobile row," which it will occupy as a salesroom and garage. The company handles Franklin cars.

The Pacific Garage & Auto Co., of Vancouver, B. C., has changed its name to Met-

ropolitan Motor Car Co., Ltd. H. Boothby is the new manager of the company, which handles Cole cars in Western Canada.

M. W. Smith has purchased an interest in the Blank & Nason Auto Co., of New Salem, N. D., H. Blank retiring from the company. The new company will do business under the style Nason-Smith Auto Co.

The Goodyear Tire & Rubber Co. is about to let contracts for the erection of a three-story building at 207-209 North Broad street, in Philadelphia. It will, of course, house the Goodyear branch in that city.

The Acme Garage Co., of Syracuse, N. Y., has leased the garage formerly occupied by the Franklin Automobile Co., at the corner of Montgomery and Water streets. A. A. Roscoe is the manager of the establishment.

The Bowles Motor Sales Co., which recently was incorporated in Washington, D. Co., to take over the business of N. S. Bowles, has remodeled the old premises at 1608 Fourteenth street and opened a supply and accessory store therein. G. W. Bready is president of the company.

Harry E. Pence, president of the Pence Automobile Co., of Minneapolis, has purchased for \$173,000 a site at Hennepin avenue, Tenth street and Hawthorne avenue, in that city, upon which he will erect a six-story building to meet his needs as northwestern agent for the Buick, Stevens-Duryea and Stearns-Knight cars. The present Pence establishment at Eighth street and Hennepin avenue, which is an eight-story structure, has so vastly increased in value that it will be converted to general office purposes. The new location is 132 x 310 feet and will include a complete plant, comprising salesroom, garage, repair shop, paint shop and other departments.

Recent Losses by Fire.

Little Falls, Minn.—A. K. Hall's garage and six automobiles destroyed. Loss, \$12,000.

Ypsilanti, Mich.—Schiabe-Weidman Motor Co.'s garage and 21 cars destroyed. Loss, \$15,000. Caused by overheated boiler in steam heating plant.

Boston, Mass.—F. L. Braley's automobile exchange, 41 Stanhope street, and four cars damaged. Loss, about \$4,000. Caused by back-fire on one of cars.

Kansas City, Mo.—Peck Automobile Co.'s garage, at corner of Troost avenue and Fifteenth street, with 62 private cars, destroyed. Loss, \$120,000. Caused by explosion of gasoline vapor.



Belfast, Me.—Eastern Sales Co., under Maine laws, with \$10,000 capital; to deal in automobiles. Corporators—Eben F. Littlefield, Howard Cheney and others.

Troy, Ohio—Troy Rubber Tire Co., under Ohio laws, with \$10,000 capital; to manufacture automobile tires. Corporators—Jacob Sweigart and others.

Bath, Me.—Bath Garage Co., under Maine laws, with \$10,000 capital; to do a general garage business. Corporators—Chas. W. Gifford, Jr., and others.

Veedersburg, Ind.—Burgner-Cade Auto Co., under Indiana laws, with \$6,000 capital; to deal in automobiles. Corporators—D. S. Cade, J. W. Burgner, O. E. Cade.

Chicago, Ill.—Lozier Motor Co., a Michigan corporation, with \$3,000,000 capital, admitted to do business in Illinois; to manufacture automobiles and other vehicles.

Kansas City, Mo.—White Motors Co., under Missouri laws, with \$6,000 capital; to deal in motor cars. Corporators—Leigh Hunt, R. C. Clark, H. D. Ellingwood.

Denver, Colo.—Morgan Garage Co., under Colorado laws, with \$5,000 capital; to do a general garage business. Corporators—James Hurley, N. M. Wagner, M. B. Gill.

Lexington, Ky.—Fayette Motor Co., under Kentucky laws, with \$10,000 capital; to deal in automobiles. Corporators—C. B. Mathias, Morgan Smedley, William P. Price.

Brooklyn, N. Y.—Auto Pleasure Club, Inc., under New York laws. Corporators—Alexander E. Pastre, Alexander L. Pastre, Elmer Peters, Frank Cash, Alexander Binks.

Columbus, Ohio—Ohio Punctureless Tire Co., under Ohio laws, with \$50,000 capital; to manufacture automobile tires. Corporators—William Moore, C. N. Bowen, H. E. White.

Chicago, Ill.—B. & L. Caster Axle Co., under Illinois laws, with \$250,000 capital; to manufacture automobile axles. Corporators—A. S. Burnell, F. E. Lyon, B. J. Crisup.

Oak Park, Ill.—Quick Service Taxi Co., under Illinois laws, with \$2,500 capital; to operate taxicabs. Corporators—Elias H. Henderson, John E. Foster, W. S. Mirowski.

Tulsa, Okla.—Standard Motor Car Co., under Oklahoma laws, with \$5,000 capital; to deal in automobiles. Corporators—W. L. Walker, William S. Baker, Clarence B. Sexton.

Chestertown, Del.—Chestertown Auto-

mobile & Garage Co., under Delaware laws, with \$25,000 capital; to do a general garage business. Corporators—M. Wilbur Thomas and others.

Portland, Me.—Lexington Co. of New England, under Maine laws, with \$10,000 capital; to manufacture and deal in automobiles. Corporators—George E. Fogg and others.

Madison, Wis.—Hydraulic Motor Vehicle Co., under Wisconsin laws, with \$15,000 capital; to manufacture automobiles. Corporators—August Baltzer, W. M. Stewart, W. B. Brown.

Buffalo, N. Y.—Buffalo Auto Novelty Co., under New York laws, with \$5,000 capital; to deal in automobile accessories. Corporators—George A. Orr, Donald S. Carroll, Henry L. Jauch.

St. Louis, Mo.—St. Louis Alco Co., under Missouri laws, with \$10,000 capital; to deal in automobiles. Corporators—Burton R. Ford, G. S. Parsons, Charles E. Darrow, J. De Buchanne.

Brooklyn, N. Y.—Reliable Garage Co., under New York laws, with \$5,000 capital; to do a general garage business. Corporators—Albert R. Doerle, Robert E. Meyers, Gerald M. Millar.

Linton, Ind.—Linton Garage Co., under Indiana laws, with \$10,000 capital; to do a general garage business. Corporators—Andrew T. Custer, George C. Porter, Thomas J. Holden.

Sheboygan, Wis.—Wilke-Bessinger Auto and Machine Co., under Wisconsin laws, with \$15,000 capital; to deal in automobiles. Corporators—Traugott Wilke, George Bessinger, Adam Wilke.

Wilmington, Del.—Dahl Punctureless Tire Co., under Delaware laws, with \$50,000 capital; to manufacture automobile tires. Corporators—G. G. Steigler, G. D. Hopkins, G. W. Dillman.

Dover, Del.—Rowan Automobile Co., under Delaware laws, with \$5,000 capital; to deal in automobiles and accessories. Corporators—Ludwig Isenberg, David Isenberg, Oscar Isenberg.

Dallas, Texas—Firestone Tire and Rubber Co., under Texas laws, with \$10,000 capital; to manufacture and deal in automobile tires. Corporators—P. B. Talbot, E. D. Manaley, J. T. Stuart.

Milwaukee, Wis.—Imperial Auto Sales Co., under Wisconsin laws, with \$10,000 capital; to deal in automobiles. Corporators—Arthur F. Tieges, Joseph E. Farber, Mrs. Joseph E. Farber.

Brooklyn, N. Y.—Mohawk Garage, Inc.,

under New York laws, with \$50,000 capital; to do a general garage business. Corporators—Bernard J. Roesler, Jr., Anna M. Roesler, Walter Roesler.

Portchester, N. Y.—Jencick Motor Corporation, under New York laws, with \$100,000 capital; to manufacture motors. Corporators—Prosper L. Schanze, David J. Daly, Irving W. Dimelow.

New York, N. Y.—Transportation Sales Co., Inc., under New York laws, with \$550,000 capital; to deal in motor vehicles. Corporators—H. Walter Webb, James L. Breese, Jr., Andre de Magnin.

Pittsburgh, Pa.—Universal Motor Car Co., under Pennsylvania laws, with \$10,000 capital. Corporators—Jacob W. Kennedy, of Washington; Cornelius Wm. M. Carleton and Harry E. Weiskopf, of Pittsburgh.

Cleveland, Ohio—Wegner Motor Co., under Ohio laws, with \$100,000 capital; to manufacture internal combustion motors. Corporators—E. C. Rock, J. B. Seymour, E. A. Williamson, L. M. Lamoreaux, J. Rupydyke.

West Ossipee, N. H.—The Auto-Drug Co., under Delaware laws, with \$15,000 capital; to conduct a retail pharmacy, act as agents of motor cars, deal in accessories and supplies and operate a machine shop and garage. Corporators—Dr. L. W. Lord, R. T. Lord, H. R. Flye, M. White.

Changes of Corporate Names.

Saginaw, Mich.—Marquette Motor Co., to Peninsular Motor Co.

Terre Haute, Ind.—Smith Motor Co. changes name to Terre Haute Motor Co.

Cleveland, Ohio—Moore & Rigby Garage and Sales Co. to the Moore Garage and Sales Co.

Grand Rapids, Mich.—Buick Motor Sales Co., manufacturers and dealers in automobiles, changes name to Grand Rapids Auto Co.

Changes in Capitalization.

Detroit, Mich.—General Motors Co., from \$10,000 to \$100,000.

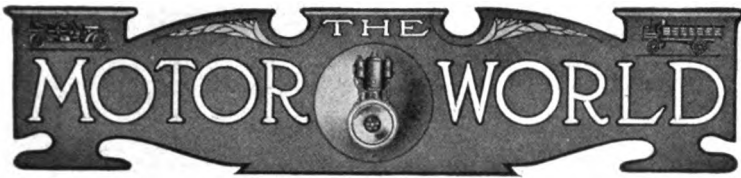
Akron, Ohio—Miller Rubber Co., from \$500,000 to \$1,000,000.

Cleveland, Ohio—Sharp Spark Plug Co., from \$10,000 to \$20,000.

East Moline, Ill.—Moline Automobile Co., from \$100,000 to \$500,000.

Augusta, Me.—Lowell Automobile Corporation, from \$25,000 to \$15,000.

Detroit, Mich.—American Auto Trimming Co., from \$50,000 to \$150,000.



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STIMULATING EFFECTS OF SLEEVE-VALVE ENGINE.

While the development of the sleeve-valve principle has resulted in the evolution of a motor that has other claims to merit than its wonderfully silent running, its production is indirectly responsible for improvements that are not confined to any one type or make of motor, but are more or less in evidence in nearly all engines now built. As a matter of fact, the sleeve-valve motor has given the whole motor industry an impetus of no small moment, measured by results already apparent.

Until the new type of motor had gained recognition there was a pretty well defined idea that the poppet was the only really practical valve for a four-cycle gasoline motor, and, furthermore, that the poppet valve had been developed until it was doing all that could reasonably be expected of it. That this view of the matter was not the correct one is indicated by the fact that there now are several practical motors without poppet valves, and the development of poppetless engines is proceeding rapidly; and that the poppet valve motor itself has undergone rigid microscopic examination, resulting in improvements that are obvious.

Although in many cases efforts to secure silent running, which has come to be considered more important than ever before, have been confined to the covering up of noisy parts so as to muffle sound, rather than to the eradication of the real causes, even this has a decidedly beneficial effect in that dirt is excluded from moving parts and lubrication improved, apart from the partial accomplishment of the real object. The elimination of the real cause of mechanical noise—lost motion—has even more important and far-reaching effects, for it necessitates close fitting and the

most accurate workmanship, and good material must be used if good workmanship is to be followed by long wear.

It is only fair to say that, as there are exceptions to every rule, so there are motor manufacturers who, long ago recognizing the mechanical infirmities which the majority of makers are now striving to eliminate, have spent a great deal of time in the microscopic refinement of details and have produced really remarkable motors. No one, however, can foretell what form the ultimate internal combustion motor may take; it may be something very different from anything now known. But whatever the form, it will not come into existence all at once, but will be a gradual development. As the inventor of the sleeve-valve engine said, when referring to his own motor, it will not "sweep the earth." But whether future generations use poppet valves, sleeve valves, rotary valves or no valves at all, the present activity will have done much to hasten the development of the perfect motor.

MOTOR TRUCKS AS AIDS TO HORSE TRADES.

"Horse trades" always have been so notoriously full of tricks as to have become proverbial; anyone, therefore, who unreservedly accepts such "trades" as signs of the times is apt to deceive not only himself but all others who may be interested in his teachings. Which observations are born of the reproduction by a western contemporary of several advertisements which periodically have appeared in the classified columns of New York newspapers and which profess to offer for sale large numbers of horses which had been or were being replaced by motor trucks. Some of the animals are "fine, chunky horses," too, and, of course, all of them were in "first class condition" and suitable for "farmers, truckmen, coachmen, icemen and all delivery purposes."

Advertisements in the classified departments of newspapers, at least those published in large cities, are, like "horse trades" themselves, too seldom what they seem. The man who swallows them whole is due to receive more surprises than usually are contained in a single storybook. Persons aware of the fact and who took the trouble to investigate the horse sale advertisements in question, when they first appeared, found that even the names of some of the alleged companies were not contained in the telephone directories at the addresses given. Actual inquiry disclosed that few horses, or no horses at all, instead of large numbers of them, were for sale, while suggestions that they were to be replaced by motor trucks excited surprise, if not derision, on the very premises.

These instances serve merely as good examples and point to the fact that signs sometimes point in wrong directions. It requires no evidence to establish that motor trucks are replacing many horses and many horse-drawn vehicles; such evidence is on every hand; in fact, it is so abundant that horse traders are turning it to their advantage. Shrewd fellows, most of them; and what can convey more suggestion or contain more allurements than sales of horses heralded as being caused by desire to replace the animals with motor trucks. It is a tempting hook on which to hang most enticing bait. The motor truck is serving the horse trader at least several convenient purposes. This is but one of them. The gentle stranger who has cut his eyeteeth will not, however, heed the trader more at this time than he did in days of yore; nor should those who make motor trucks, or those who sell them, be too quick to believe that every advertised sale of horses "to be replaced by motor trucks" means the opening of another avenue for them.

GLIDDEN TROPHY NOT WHOLLY LOST

Still Will Be an Award in New A. A. A. Tour—The Probable Route—Paid or Unpaid Chairman.

Because it was voted at the last regular monthly meeting of the executive committee of the American Automobile Association, held in the Blackstone Hotel, in Chicago, on Friday last, 2d inst., to promote a National Reliability Tour for a new trophy, the report was spread broadcast that the Glidden trophy was to be shelved or otherwise eliminated from future A. A. A. touring events. But such is not the case. When the 1912 national reliability tour comes to pass the Glidden trophy will be found to be occupying a prominent place among the several trophies that will be offered. Probably it will be offered as a team prize, as it was last year, and several other years before that, but at any rate it will not be the principal prize, for at the meeting a new A. A. A. trophy, to cost \$5,000, was provided for and will be paid for by various State bodies in the association. It is likely to be offered for individual competition, as A. A. A. officials believe that such a condition will be a contribution to real amateurism. David Beecroft, of Chicago, was appointed chairman of a special committee to collect the funds and procure the trophy.

As to when or where the tour will be started, however, little or nothing has been definitely decided, though it is almost certain that New Orleans will be the destination. It is expected that the comparative nearness of the Crescent City to the Panama Canal, allowing of the possibility of an excursion thereto, will act as a magnet in drawing entries. Last fall, Minneapolis was keen to be made the starting point of the tour, but the keenness has become dulled and Minneapolis has declared itself out of the hunt. There are five other tentative starting points on the list, however, and it is likely that any one of them may be chosen. They are Detroit, Cleveland, Indianapolis, Cincinnati and Buffalo.

Two years ago the A. A. A. voted to shelve the Glidden trophy because of the bickerings which occurred over it, and to promote another contest under the very name National Reliability Tour, but before it got very deep into the matter it was found that sentiment was so strongly in favor of retaining the Glidden trophy that the substitute project was abandoned. In the interim, however, the Glidden trophy has been the cause of still more ill feeling, which led eventually to the law courts, and it is not improbable that the present decision was influenced in a measure by this circumstance. That Charles J. Glidden himself accepts the situation in good part is evidenced by the fact that immediately he heard of it, he wired his entry to com-

pete in the new tour for the new trophy.

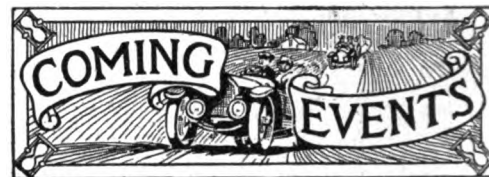
Another of the important matters which came before the meeting in Chicago involved the appointment of a permanent chairman of the contest board. The discussion revolved around the question of the advisability of appointing a professional to the post, for though William Schimpf, appointed at the death of Samuel M. Butler, has served without remuneration, there are those who think it advisable to employ a paid chairman, despite the fact that there is no doubt of the efficiency and loyalty of Schimpf and his willingness to serve for pure patriotism and without pay. For the purpose of threshing out the matter with the Manufacturers' Contest Association, President Hooper was empowered to name a committee of three, including himself, and he chose First Vice-President Joyce and ex-President Spear. When they meet the representatives of the Manufacturers' Contest Association, the matter of providing ways and means to assure a reasonable amount of competition during the present year will be discussed.

Illinois Dealers Form National Association.

Every year, or at least every other year, the period of the Chicago show is marked by the formation of a national organization of automobile dealers which elects officers and of which little, if anything, thereafter is heard. On Wednesday of last week, this almost perennial plant was again made to blossom in the form of the National Automobile Dealers' Association, which was brought into being at a meeting in the Hotel Sherman. While the organization adopted a national title, it will be incorporated under the laws of Illinois and all of its officers are Illinois dealers, as follows: President, R. S. Winegar, Springfield; vice-president, Julian Broehl, Pana; secretary and treasurer, F. A. Young, Bloomington; directors: L. F. O'Donnell, Jacksonville; Homer W. Wilson, Carlinville; D. F. Marquard, Lincoln; James G. Parker, Maroa; C. M. Jones, Clinton; A. H. Gain, Roodhouse; M. Ritchford, Granite City.

A. C. A. Members Oppose Changes.

For the first time in a considerable period, evidence of real life and interest is being displayed in the Automobile Club of America, by at least a portion of its membership; and all because of proposals to amend the constitution and by-laws so that hereafter the Board of Governors, elected by the members, shall in turn elect the officers of the club, and also permit members to cast their votes by proxy. The amendments are due to be presented at a special meeting on the 19th inst., but some of the older members believe that the right to vote for officers should be retained and in order to voice their opposition, they have signed a call for a special meeting to occur four days previous to the date set for the approval of the amendments.



February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory

February 12-17, Troy, N. Y.—Troy Automobile Club's annual show.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.

February 14-17, Grand Rapids, Mich.—Third annual show.

February 17-24, Cleveland, Ohio—Cleveland Automobile Show Company's annual show in Central Armory.

February 17-24, Newark, N. J.—New Jersey Automobile Exhibition Co.'s annual show in First Regiment Armory.

February 17-24, Pittsburgh, Pa.—Pittsburgh Automobile Show Association's annual show in the Exposition Building.

February 17-24, Minneapolis, Minn.—Minneapolis Automobile Show Association's annual display at National Guard Armory and Coliseum.

February 19-24, Hartford, Conn.—Hartford Automobile Dealers' Association's show in the State Armory.

February 19-24, Omaha, Neb.—Omaha Automobile Association's annual show in the Auditorium.

February 19-24, Cincinnati, Ohio—Cincinnati Automobile Dealers' Association's annual show of pleasure cars in Music Hall.

February, 20-24, Poughkeepsie, N. Y.—Annual show in the State Armory.

February 21-24, Louisville, Ky.—Louisville Automobile Association's fifth annual show.

February 21-25, New Orleans, La.—New Orleans Automobile Dealers' Association's first annual show in Washington Artillery Hall.

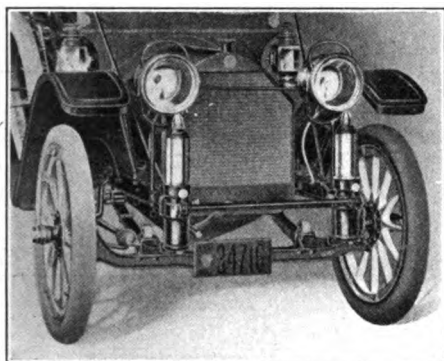
February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.

February 26-28, Cincinnati, Ohio—Cincinnati Automobile Dealers' Association's commercial vehicle show in Music Hall.

HERE'S WESTINGHOUSE'S SPRING

His Long Awaited Invention Finally Ready for Marketing — Ingenious Application of Pneumatic Principle.

Following the preliminary announcement of two weeks ago, the entire particulars concerning the Westinghouse air spring and the production plans of its sponsor, George Westinghouse, have been disclosed. As was stated in the Motor World, the new device, which has been in process of evolution for some three years, is being manufactured by the United States Rapid-Fire Gun & Power Co., of Derby, Conn., for Westinghouse who retains the sole ownership of all manufacturing rights. C. H. Williams who is the president of the Derby concern has been appointed general agent for Westinghouse and will attend to



THE SPRINGS IN PLACE

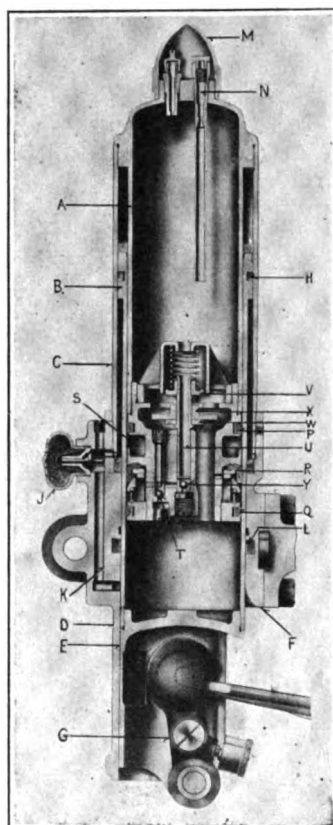
the marketing of the springs. One thousand springs, or enough to equip 250 cars, will be ready immediately.

In presenting the spring in its perfected form, Westinghouse makes frank acknowledgment of his indebtedness to the Reverend Lansin Van Auken, of Troy, N. Y., for the basic idea, though in doing so he explains that the vital patents under which it is manufactured are in his own name. In a visit to Troy, so the story goes, Westinghouse came across the clergyman and two mechanics, Richard Liebau and Robert P. Reid, who were experimenting with the device in a small shop. Like so many other brilliant inventors who have been quick to see the practical value of an unperfected device and almost in a flash to see a method of perfecting it and making of it a commercial possibility, Westinghouse realized the worth of the idea and set to work on it. But though steady progress was made it was not until the last few weeks that the device eventually was brought to its present state of perfection.

It is but natural that during its evolution the spring should suffer considerable alteration and refinement though the basic principle remains the same. "It is a shock preventor," to quote the words of Westing-

house himself, who is a soft-spoken kindly white-haired gentleman, and not a spring wheel or a shock absorber or an auxiliary spring though it partakes of the functions of both the two last named devices. It is really a flexible connection which serves to join the ordinary steel springs of a vehicle to the chassis frame and to bear the great inventor tell of its manifold advantages, chuckling quietly to himself the while, is to become imbued with his own conviction that it is a device that really is nothing short of remarkable.

"I've had it on my own car," he said to a Motor World man in his quiet matter-of-fact way. "It's a comparatively heavy Pierce-Arrow and I've ridden in it for 10,-



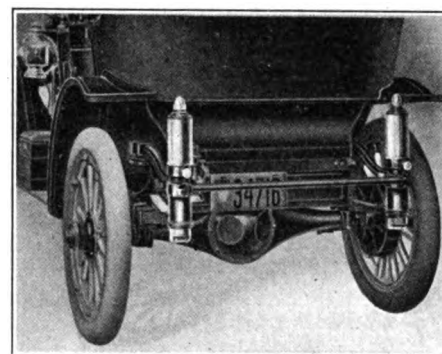
AIR SPRING IN SECTION

000 miles. I never knew before what really smooth riding was. Even riding over rough cobble pavement and car tracks I scarcely could tell whether I was in my private car (referring to the Pullman in which he travels between his offices in Pittsburgh and New York) or in the automobile."

"No, it is not intended to make possible the elimination of pneumatic tires," he said in response to a query. "But it will increase the life of pneumatic tires for the simple reason that it prevents the shocks to which they ordinarily are subjected, while at the same time permitting them to be inflated to their maximum capacity without causing discomfort to the passengers. I have ridden in my own car equipped with solid tires and without any tires at all with no discomfort, but rubber tires of some sort are necessary, and we have demon-

strated that only up to certain speeds are solid tires practical. Their 'road action' is not good at higher speeds, and there is difficulty in steering the car. In their original form the springs were designed to take the place of all other springs, but we found that for a device which is intended to be applied to existing types of vehicles their attachment required too much special construction and fitting. It was decided, therefore, to use them in combination with the steel springs ordinarily used, and this method we found was even better than the air springs alone."

In its most elementary form, the air spring consists of a deep metallic cup attached to the frame of the vehicle and telescoping into another cup of slightly larger diameter attached to one end of the ordinary steel spring. It is the air in compression between these two cups which gives the spring action. By varying the pressure of the air in the cups the strength of the spring may be varied at will. By partially



TYPICAL REAR SUSPENSION

filling the chamber with oil, or any other suitable liquid, the volume of the contained air will be reduced and for each inch that the cups are telescoped the air will be compressed by a greater percentage of its original volume. Consequently the resistance increases more rapidly than when the fluid is absent. As the volume of air in the chamber, as regulated by the amount of fluid present, influences the rapidity with which the resistance to compression increases it determines the "scale" of the spring. With both the initial tension of the spring, as represented by the air pressure in the chamber, and its scale under control the spring adjustment can be varied to give almost any desired characteristic.

That is the principle on which the air spring operates, though actually it is much more complicated than the simple chamber that has been outlined. The single simple telescopic joint, no matter how well made, is not sufficient to keep the air and oil in, of course, and there are other reasons for the greater complication as evidenced in the spring itself which is shown in section herewith.

A is the upper section of the cushion chamber telescoping into the lower section, which is made up of the tube B and

the crosshead E. The lower tube C acts as a guard to keep mud and dust from the telescopic joint A and B. D is a steel casting bored out to form a guide for the tube B and the crosshead E. F is a rectangular pad on D for bolting the spring to the bracket on the frame of the car. G is a shackle or link, the upper end of which is coupled to the steel spring forming part of the regular equipment of the car, and the lower end is pivoted to the crosshead E. The upper end of the tube B has its outside diameter increased to form an annular piston with a packing ring H fitting the inside of the tube C. J is the "breather," which is an air inlet covered with a perforated cap filled with a fibrous filtering material.

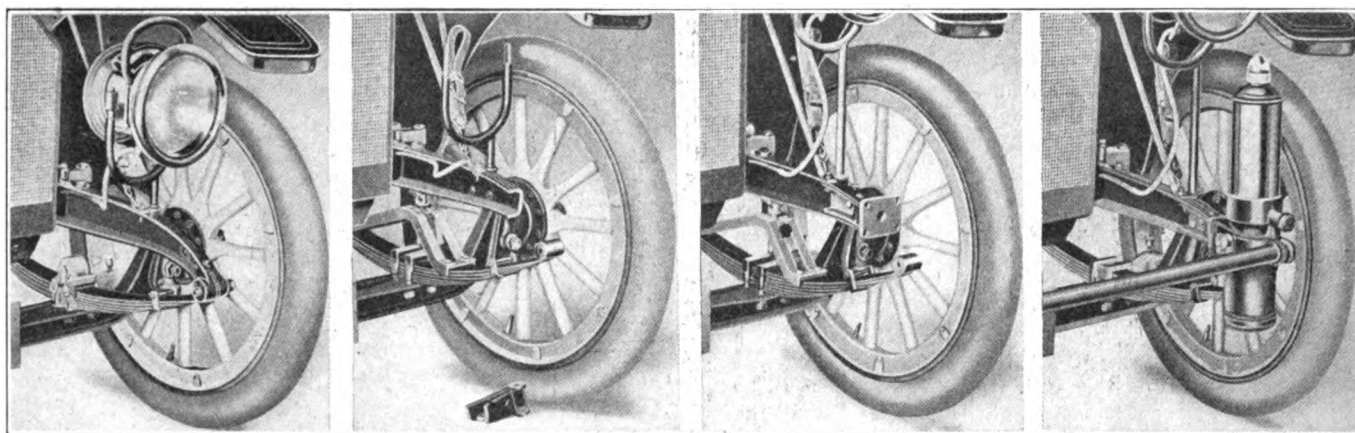
When a load is placed on the car and the

venience. The air spring normally is filled with oil to a height just sufficient to cover this piston. The packing is, therefore, oil-sealed, and there is no opportunity for the air to escape. P and Q are plain leather packing rings, and R is a deep cup-shaped leather packing set out by means of a conical spring and springs. Though it is not possible to make this packing oil tight it is explained that a slight leakage of oil is desirable in order to insure lubrication. The small volume of oil that escapes past the ring Q and the leather R is caught in the annular chamber S whence it runs through the vertical tube indicated by dotted lines into the chamber just beneath the ball valve T.

U is the hollow plunger of a small single-acting pump. On the upper end of the pump

the bottom of its stroke. The oil that was drawn into the pump cylinder passes by the ball check valve Y, up through the hollow plunger and is discharged back into the cushion chamber. Oil is introduced by removing the cap M and valve N.

Normally the air springs have a range of action of six inches, three inches up and three inches down. This is in addition to the range of action of the steel springs to which they are attached, of course. As has before been mentioned it is possible to vary both the range of action of the springs and their compressibility by varying the amount of oil contained in them, and also by varying the air pressure. Like all other pieces of mechanism the air spring requires a certain amount of attention, though the actual amount required almost is negligible

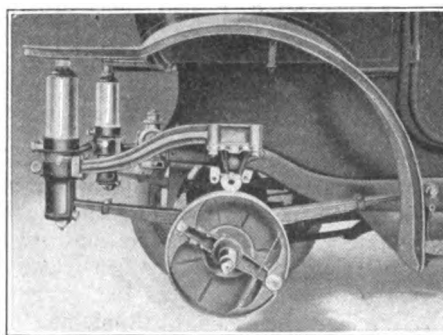


SHOWING IN DETAIL THE METHOD OF ATTACHING THE WESTINGHOUSE AIR SPRINGS

air spring is compressed air is drawn through the "breather" into the annular space between B and C. When the spring is permitted to assume its normal position again this air is forced downward through the passage K into a port partially surrounding the tube B. There being no packing between the tube B and the guide D, below this port, the air blows out between the tube and the guide and prevents the entrance of grit and dirt. L is a felt wiper ring which is a further protection against dust and which also prevents the escape of lubricating grease introduced into the shallow groove just above the wiper. The semi-circular projection just below the "breather" (J) is a connection for a tie rod or distance piece between the two front or rear springs. The initial air pressure is obtained with a pump which is connected to the valve N, covered by the cap M.

It is in the apparatus by means of which the leakage of oil is controlled, however, that the real ingenuity of the device is revealed. This apparatus constitutes the real essence of the invention, and is attached to the lower end of the chamber A. It is a piston in the sense that it carries the packing for the telescopic joint, but in as much as there is a passage through it making communication between the spaces above and below it, the term piston really is a misnomer; it is used merely for con-

plunger are secured two collars V and W, and between them is a sliding disk X. The diameter of this disk is such that it almost fills the slightly constricted passage above it. The plunger is normally held at the bottom of its stroke by a light spiral spring



THREE-QUARTER ELLIPTIC ADAPTION

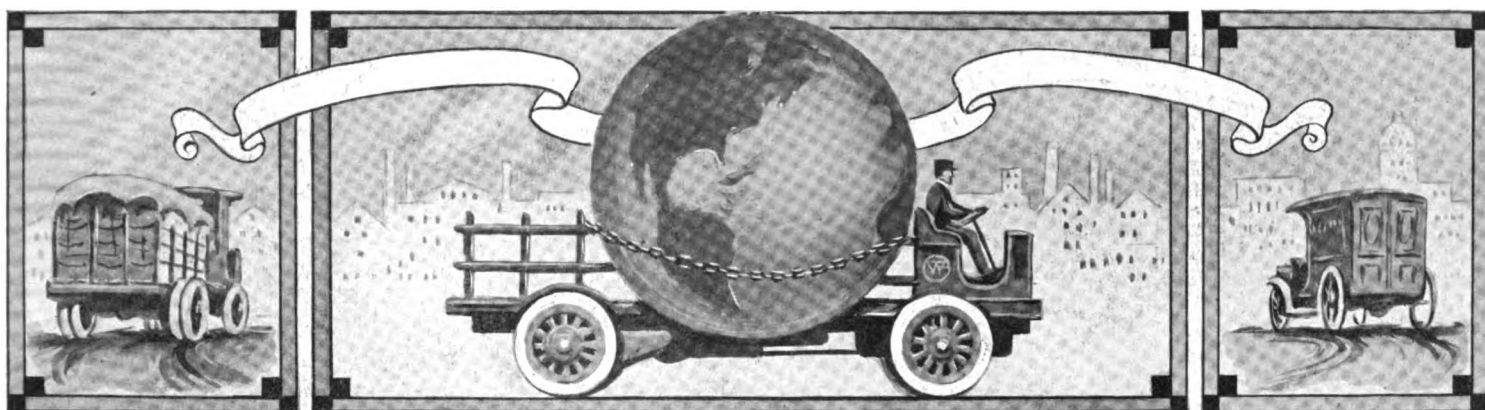
pressing on the collar V. When the air spring is compressed, the downward motion of the piston causes a current of air through it in an upward direction. This current raises the disk X until it strikes the collar V lifting the plunger of the pump which draws in a charge of oil. When the spring extends again the oil current flows through the piston in the reverse direction, carrying the disk X down until it strikes the collar W and forces the pump plunger to

after it once has been properly adjusted.

As for the method of attaching the springs to the standard cars, this is shown quite clearly in the accompanying illustrations. The front end of the frame is sawed off and the pad shown is bolted in position after which it is but a few minutes work to attach the spring to the frame and the steel spring. For rear suspensions employing three-quarter elliptic members a special bracket is furnished to take the place of the upper spring member. In fact it is to the production of suitable brackets for every make of car that attention is at present being directed. Already brackets suitable for attaching the springs to some 20 different brands of car have been worked out, and are ready for delivery, and it is expected that in the near future brackets for every standard car will be available on short notice.

How the S. A. E. Will Convey Its Thanks.

In token of its appreciation of the many and great courtesies extended to the S. A. E. members who made up its recent European party, the Society of Automobile Engineers is having prepared an illuminated address in which formal acknowledgment will be made to the Institution of Automobile Engineers, of London. All agree that in its role of host to the American visitors the Institution did itself proud.



CHICAGO TRUCK SHOW PROVES "BEST EVER"

Includes Most Vehicles Displayed in New York and 33 Others—Western Ingenuity Disclosed in Unexpected Places—Worm Drive Gains Adherents—A. O. Smith's New Truck a Notable Development and Great Dain Marks Departure in Friction Transmission.

Those who have memories that reach back five years—to 1907—and can call to mind Chicago's first commercial vehicle show—and the first held in this country—the funeral affair held in the old Tattersall building, erstwhile a horse mart of more or less repute, and have viewed the present truly magnificent display staged in the Coliseum and First Regiment Armory mid decorations can best realize the marvelous advance that has been made in that short space of time. The 1907 affair was a failure, almost; exhibits were few, the attendance was small and the interest near to the vanishing point; in fact, the scanty decorations did vanish. They caught afire and were consumed, though no other damage was done.

Trucks were displayed at the automobile shows of the intervening years, of course, but they were staged with the pleasure cars, and it was not until last year that Chicagoans viewed their second show devoted exclusively to commercial vehicles, and though it was a big one and of tremendous importance it can't hold a candle, nor even a match, to the present exhibition. Nor can this year's New York shows, for that matter; for there are a greater number of manufacturers represented in the Coliseum and the Armory than there were in the two New York shows together. At Madison Square Garden there were 32 brands of trucks exhibited, of which eight were electric, and at Grand Central Palace there were three makes of electrics and 33 makes of gasoline trucks on view, making 68 all told for both shows. In Chicago there are no less than 81 separate exhibitors of commercial cars, seven of whom show electrics. There are so many trucks on view that the Coliseum can't hold them

all; the Armory had to be used as well, a thing unheard of before in the annals of Chicago's two-weeks shows.

It is the biggest and the handsomest and the most important commercial vehicle show that ever has been held in the West or anywhere else, and according to present indications bids fair to be every bit as successful as was last week's pleasure car show which was but Part I of the National Association of Automobile Manufacturers' annual Chicago show. And that certainly is "going some," for the pleasure car show was a "whale" in every respect.

The Chicago shows differ from those that are held in New York in that there are no cars staged "upstairs," so to speak. The galleries are occupied exclusively by accessory exhibitors. So that there really was not a very great amount of work necessary to shift the pleasure cars out and the commercial vehicles in. At 10:30 on Saturday night last the pleasure cars were started toward the doors and by Monday noon they were out and the trucks were in their places. Also 62 accessory exhibitors moved out and 16 new comers went in.

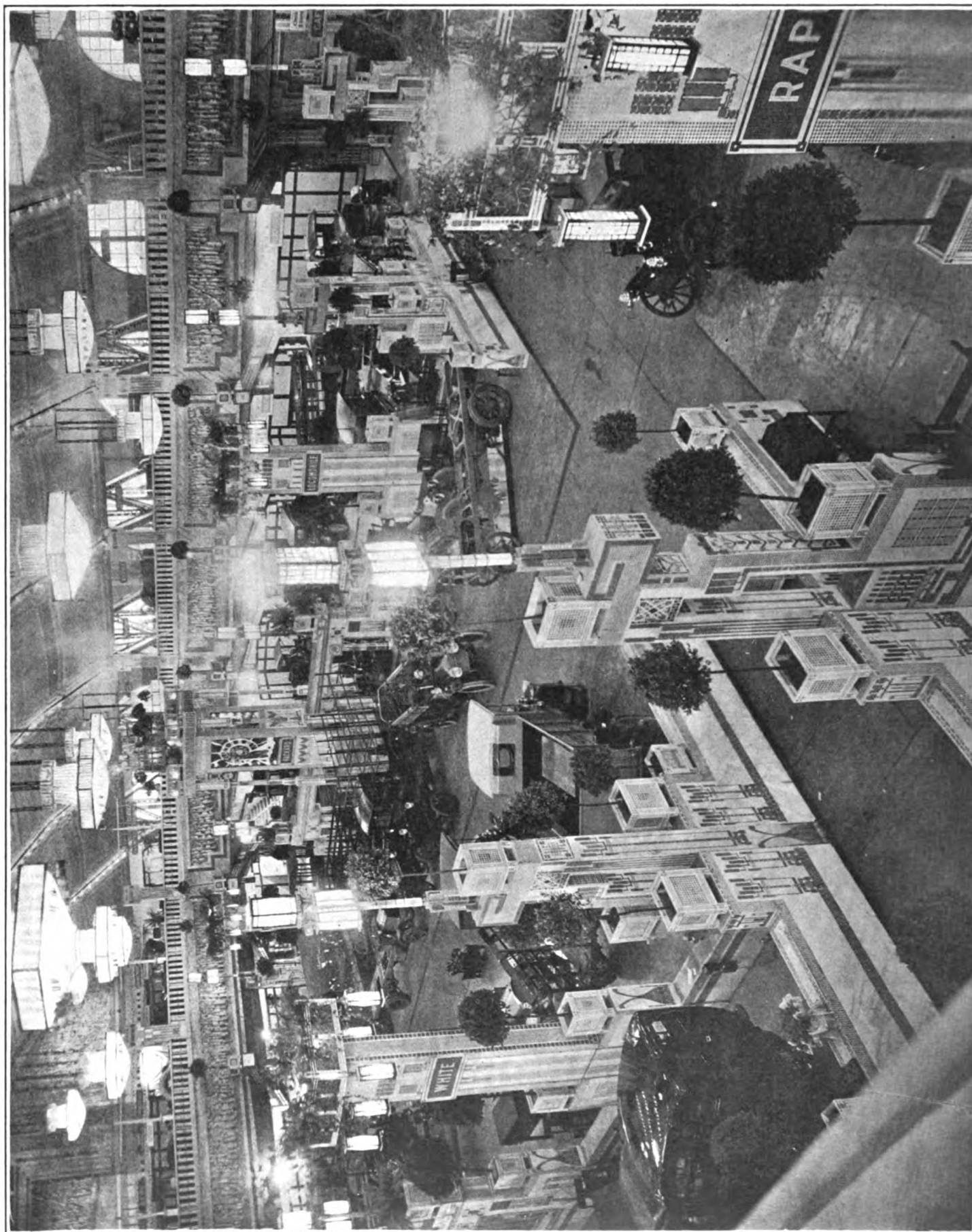
Just as the pleasure car show was the handsomest and most spectacular that ever has been held so is the truck show for the decorations were not even disturbed. The same mosaic decorations are there and with the help of the immense panoplies and centre pieces and wonderfully constructed "sky" the Coliseum looks just as "Alice-in-Wonderland-like" as it did last week; but if anything the trucks look more out of place in such a setting.

Of course it was to be expected that in the matter of individual exhibits the show would be more spectacular than were the

New York functions for as has been pointed out there are 13 more manufacturers represented than there were at the two New York shows combined. Apparently Western manufacturers are turning just as much attention to the building of special bodies as are the others for the exhibition of ambulances and patrol wagons, and fire apparatus and other special adaptations is one of the features of the show.

As was the case with the pleasure cars many of the manufacturers who exhibited in New York simply transplanted their exhibits bodily to Chicago and as the majority of them are special adaptations of standard vehicles the display is more than ordinarily comprehensive in the inclusion of such bodies. Almost as a matter of course the Packard "Prairie Schooner" is there, and it attracts the same curious crowd, anxious individually to add its initials to those that already adorn the canvas sides of the car, as it did at its first show appearance. Similarly, the odd-looking but evidently serviceable dump wagons are out in force—the Alco, the Mack, the Sampson, the Speedwell, the Pierce-Arrow and others. In more conventional types there are such well-known makes as the White, Lozier, Federal, Stearns, Peerless, Locomobile, Commer, Pope-Hartford, Knox, Garford, Autocar, Gramm, and a host of others. Scarcely a name that decorated a sign in New York shows is missing, and in addition there are just 38 brands that have not been exhibited before this year.

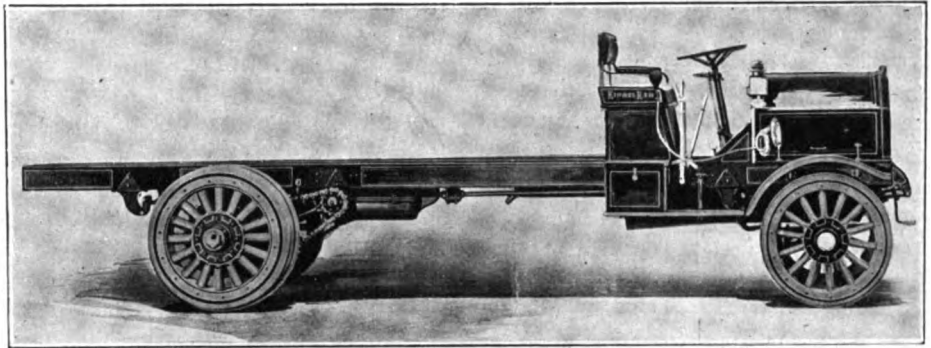
Mechanically there is not a very great deal that is either brand new, or radical in design or construction. Perhaps the most unexpected development is the increase in the number of trucks which employ worm drive. The Pierce-Arrow of course is the



HOW THE TRUCKS APPEAR IN THE WONDERFUL "MOSAIC PALACE" IN THE CHICAGO COLISEUM

admitted leading exponent of the system, but the Chicago show revealed no less than three new worm driven vehicles. Of the number the Smith which is manufactured by the A. O. Smith Co. of Milwaukee, Wis., heretofore famed only as one of the world's largest producers of parts, is perhaps the most notable. At least it embodies the greatest number of unusual features and not the last of them is the extreme accessibility of the worm and wheel mechanism. The Great Dain is another truck which appears for the first time, and which features worm drive. In addition it embodies a novel form of friction change-speed mechanism which also provides a direct drive from the engine to the rear axle—a feature which never before has been attempted. The Blair truck is the third newcomer featuring worm final drive.

That the four-cylinder engine rapidly is coming to the front in point of truck popularity was indicated by the New York



SIDE VIEW OF KISSEL FIVE-TON CHASSIS

time this year—and in some cases for the first time in any year.

Kissel Truck—Capacity, 1,500 Pounds-5 Tons; Prices, \$1,500—\$4,525.

Perhaps the line with the greatest range is the Kissel, which begins with a 1,500-pound delivery wagon and goes up to a 5-

are in design similar to Kissel pleasure cars, but are fitted with heavier axles, springs, and similar parts. The two small cars and the 2-ton truck have pressed steel frames, while the three larger ones employ 6-inch and 7-inch channel steel. All the Kissels have extremely large brakes and also are fitted with differential locks. It is stated that in the 3, 4 and 6-ton trucks 6-ton equipment is used throughout. Kissel motors are of the L-head type, with cylinders cast in pairs, and with Mea or Bosch magnetos, cone clutches and four-speed selective transmissions. The larger trucks have chain drive and dual tires.

Avery Truck—Capacity, 2, 3, 5-Ton; Prices, \$2,700—\$4,500.

There is considerable difference in the various models of the Avery line, but in a number of instances the same dimensions of parts prevail. In all models a 45-horsepower motor is used as well as an eleven-plate disk clutch. There is little difference in the layout of the 2 and 3-ton trucks so far as design is concerned, but in the 5-ton, for instance, a chain case is used, while this is not put on the smaller models. The motor is suspended from a subframe and the transmission is made a unit with the jackshaft housing. On the 3-ton there is a double rear spring suspension on each side and this truck is also fitted to do traction work. The 3-ton is arranged with the Avery cast steel rim wheels and wood plug tires, and there are fittings whereby a steel felloe with mud hooks, another with ice spikes may be fitted. These are designed for use where possibly a plow or trailer



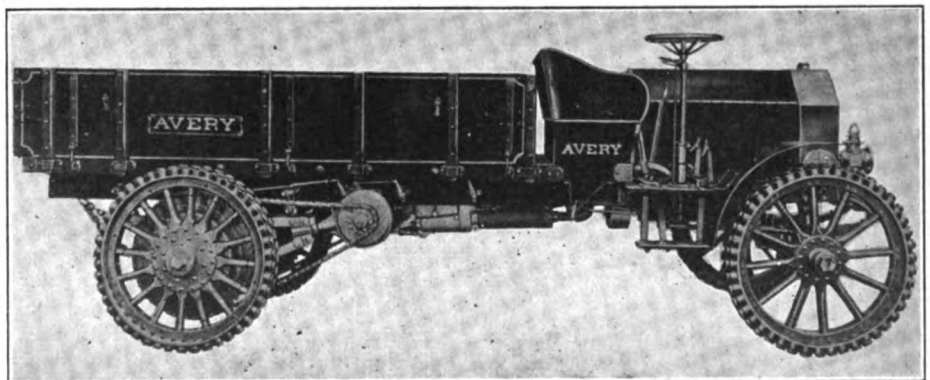
AVERY TRUCK WITH ROOFED PLATFORM BODY

shows and the indication is considerably strengthened by the Chicago exhibit. Very few of the newcomers employ two-cylinder engines and several of the older cars which heretofore have been equipped with them now have four-cylinder motors. As for single cylinder motors, there are only two makes exhibited which employ them.

In the two buildings there are staged the exhibits of 221 manufacturers, of whom 81 show vehicles, 74 of them being manufacturers of gasoline trucks, and the other seven showing electrics, 124 accessory exhibitors and 16 motorcycle exhibitors. Individually, there is evident even more refinement of detail than at the New York shows and consequently it requires a thorough review of their distinctive features to bring them to light.

None of the trucks that were exhibited in New York ever have been known to alter materially in so short a space of time as has elapsed, and it is natural therefore that the greatest interest should center around those that are being shown for the first

ton truck. The line exhibited at the show embraces a 1,500-pound and a 1-ton delivery wagon, and the 2, 3 and 5-ton trucks. The 1,500-pound wagon uses a $4\frac{1}{4} \times 4\frac{1}{4}$ motor, the 1-ton a $4\frac{1}{2} \times 4\frac{1}{2}$ motor, the 2-ton the same, while the larger trucks use the $4\frac{7}{8} \times 5$ -inch motor, all being of the four-cylinder variety. The two smaller wagons



AVERY COUNTRY TRUCK WITH WOOD BLOCK TIRES

may be used in soft ground, and where traction would be lost. Avery motors have individually cast cylinders, with flanges around the bottom part to assist cooling. They are conventional in other respects

Rutenber of four cylinders, fitted with a Bosch fixed spark magneto and the throttle control on the steering post. A disk clutch is employed and the power is transmitted through a propeller shaft to a selec-

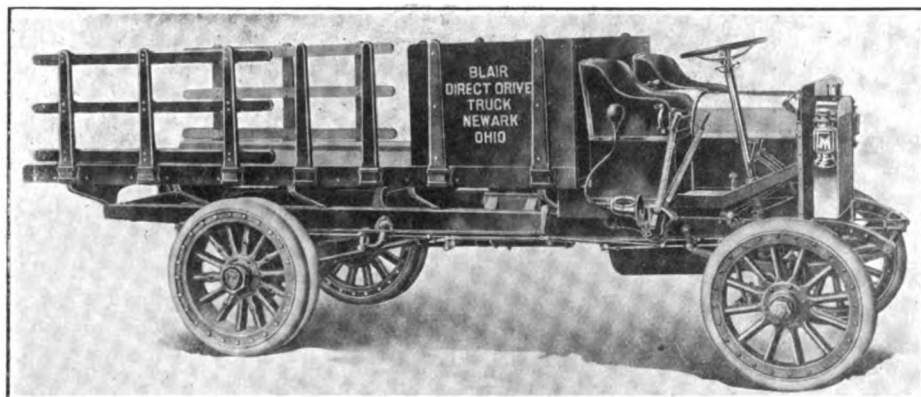
tires are used, 34 by 4 for the rear and 34 by 3 inch for the front. The chassis weighs 2,850 pounds. At present the maker, the Harwood Barley Mfg. Co., Marion, Ind., is making as standard bodies an express 4 feet 2 inches wide and a platform 5 feet 9½ inches wide, although special bodies are made to order.

Dorris Trucks—Capacity, 1½ Tons; Price, Chassis, \$2,500.

St. Louis is represented by the Dorris, made by the Dorris Motor Car Co., which shows a 1½-ton truck and a light delivery wagon of 1,500-pound capacity with touring car design chassis except that it is heavier all through. The 1½-ton model is conventional to the extent that the jackshaft and rear system are of Timken construction, while the power plant is the Dorris motor of 4¾-inch bore and 5-inch stroke, with overhead valves. The motor is fitted with a centrifugal governor acting on a butterfly valve in the intake pipe, and is ordinarily set for 12 miles an hour. In the Dorris motor the crankcase is of bronze, the oiling device is of the self-contained system, and the fan is in the flywheel. The transmission case is of manganese bronze and is bolted to the end of the motor base, making a unit. Something out of the ordinary is the water jacket placed around the inlet pipe from the carburetor to the branch. This is connected with the water circulating system and being kept warm supplies warm gas to the motor at all times. A Bosch dual system is used for ignition and a Prest-O-Starter is fitted also. In the matter of spring suspension half ellipsics are used all around, with an auxiliary cross spring in the rear, carried under a cross member. Both ends of the rear and the back end of the front springs travel on hardened rollers.

Natco Trucks—Capacity, 1 Ton; Price, \$2,150.

In the Natco, made by the National Motor Truck Co., of Bay City, Mich., the mo-



WORM DRIVEN BLAIR WITH PLATFORM STAKE BODY

and are built for the heavy work they are called upon to do.

Blair Trucks—Capacity, 1½, 2½, 3½ Tons; Prices, \$3,000—\$3,750.

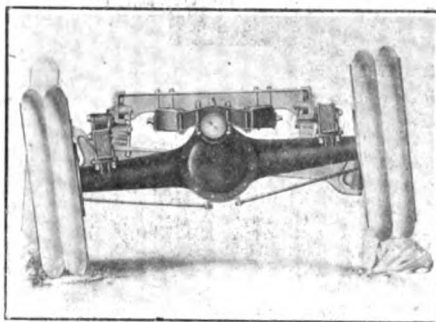
Blair trucks have made a decided impression because of the setting of the power and transmission plants on a subframe that rests on the back axle at one end, and has at two-point bearing on the frame at the other end, and having also a worm drive. The subframe is made of channel steel and from the front to a point back of the transmission the two members are parallel, but from this point they narrow and are extended past the worm housing, being held by means of a double bracket. Just back of the transmission case is a cross member and to this is attached the strut rods which are attached to the rear axle housing. The propeller shaft is carried through a large hole in this cross member, but does not touch it. The motor, transmission, shaft and all are in direct line at all times. The drive shaft has two couplings, one back of the transmission case and the other immediately forward of the worm housing and the transmission brake, which is attached to the propeller shaft. These couplings are interposed in order to facilitate removal of the parts.

Block motors are used and they have enclosed valves, self-contained oiling systems and are in two sizes, 4½ x 5¼ inches, and 4½ x 5½ inches. In both sizes a cone clutch with cork inserts is used, while selective transmission is also a part of the specifications. The front springs are semi-elliptic, while the rear are of the platform type, with a very substantial cross member carrying the rear cross spring.

Indiana Trucks—Capacity, 1 to 1½ Tons; Price, \$2,000.

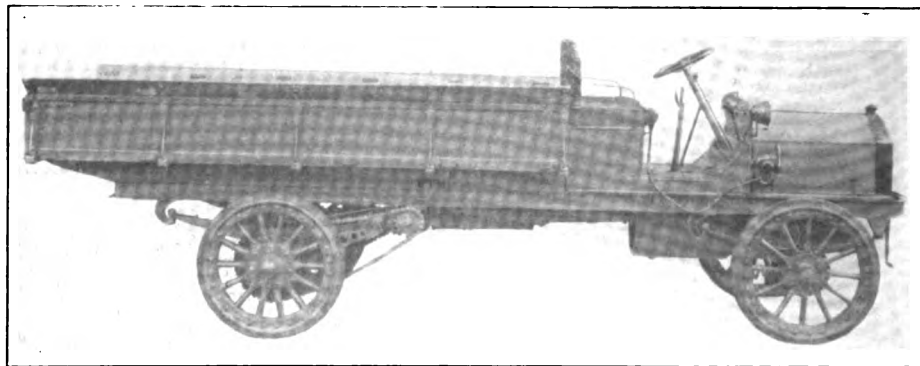
A truck with the frills eliminated probably is a good definition of the Indiana, which is given a load capacity from 1 to 1½ tons. The motor is a 4 by 4 inch

tive type transmission just forward of the jackshaft, the housing of which is bolted to the frame sides, final drive being by double chains. The frame is of 5-inch channel steel and the side members are



BLAIR REAR SUSPENSION

connected in front by a heavy bumper to protect the radiator. The design carries a wheelbase of 120 inches, giving a reasonable overhang. Semi-elliptic springs are employed all through, and these are mount-



INDIANA TRUCK WITH OPEN EXPRESS BODY

ed on I-beam front and rectangular back axles, the wheels running on Bower roller bearings. The jackshaft is of the semi-floating type, with the drive shafts 1¾ inches in diameter, driving to sprockets through chains with 1¼ inch pitch. Solid

tor is cast in a block and has a bore of 3½ inches and a stroke of 5 inches, being of the L-head type and having fixed ignition, self-contained oiling system, with the oil cleansed through water, hollow crankshaft, cone clutch and with a fan in the flywheel.

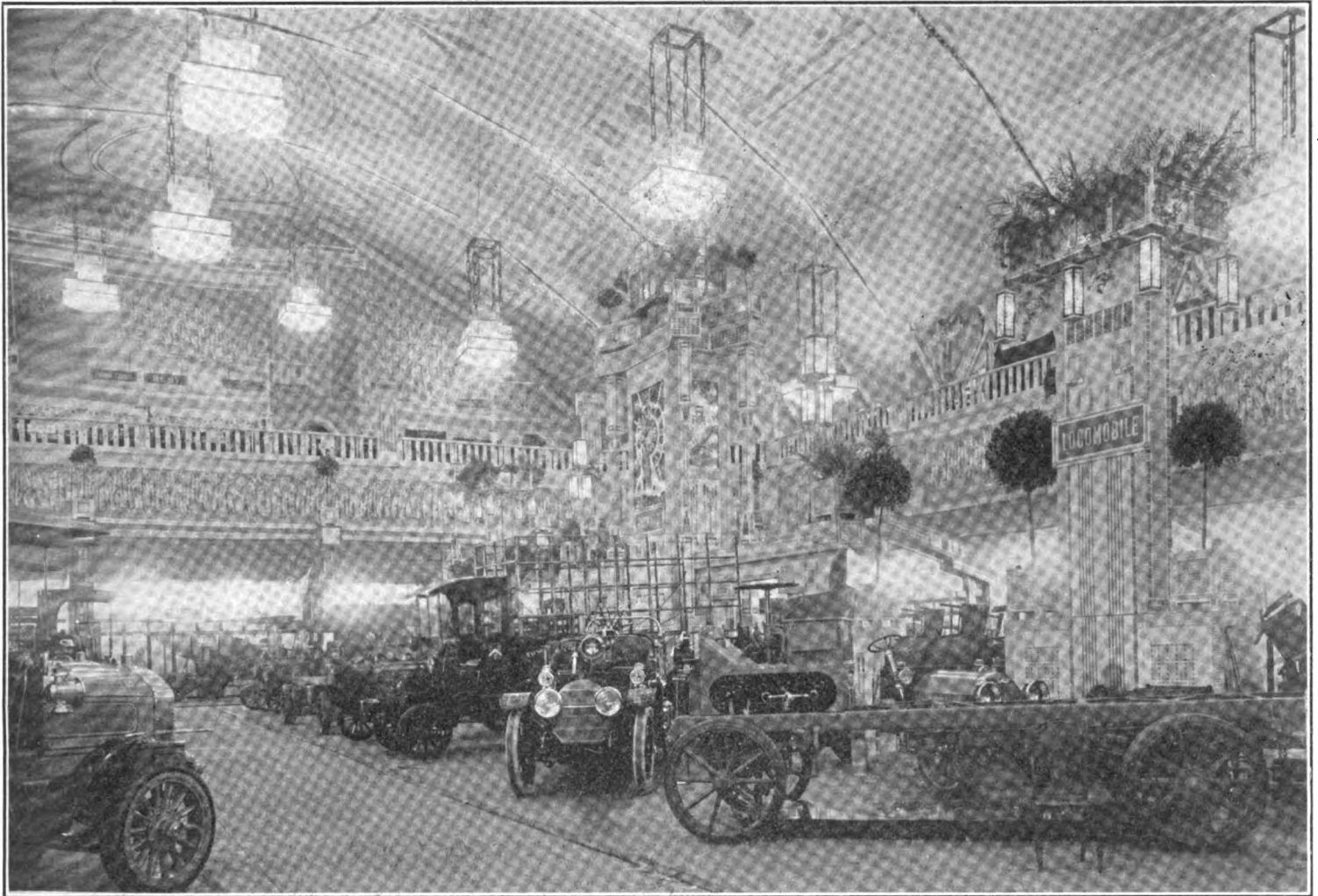
In addition, thermo-syphon is used in the cooling scheme. The motor is supported on a subframe and is so located that the driver's seat is brought up to the back end of the engine, the bonnet being a small affair and apparently on the floor boards, still giving ample foot room for driver or helper. With the removal of the bonnet pretty much all of the motor is exposed for adjustment or cleaning. The jackshaft is of the full floating type, the housing being attached to the under side of the frame

the chassis is given as 2,400 pounds and the price \$2,150. The National company is under the same management as the National Cycle & Mfg. Co., one of the old bicycle concerns.

Wilcox Trucks—Capacity, 1 to 3 Tons; Price, \$2,300—\$3,250.

Although the H. E. Wilcox Motor Car Co., of Minneapolis, makes a number of sizes of trucks, including 1, 1½ and 3-ton models, only one size, the 3-ton, is shown.

be called a strut rod, this connecting the bracket and the front axle at the spring bracket. The power is taken through a selective speed change set to a jackshaft and then through chains to the rear wheels. The end of the jackshaft extends well past the frame and is supported by a heavy bracket, the driving sprocket and brake being between the bracket and frame. In the transmission a locking device is provided so that the gears are held in place until shifted by the shift lever. The transmission case



THE TRUCKS IN THE SHADOW OF THE MOSAIC CLOCK TOWERS AND "ROOF GARDENS"

sides. The final drive is through double chains, which are encased and run in an oil bath. The springs are semi-elliptic, while an auxiliary cross spring is carried under a double cross member, which converges at the center, thus serving as a cross member and a brace for itself as well. The frame is of pressed steel and is narrowed in front to permit of short turning. Large breaks are used and efficient equalizers are located on the left side of the transmission. The steering wheel is placed on the left side and because of the position of the motor, or, rather the driver's seat, it comes directly in the center of the motor at the side. Thirty-six inch wheels are used in both front and rear, with solid tires and detachable rims. The weight of

It is in chassis form and also with a small bungalow body, which is used as an office and which has attracted much attention. There is individuality in the Wilcox in that the power plant is set 7½ inches to the left of the center of the chassis, giving ample room for the steering gear. The motor is mounted on a subframe close to the radiator, with the driver's seat and control levers at the right. The same motor is used in all sizes, being 4½ x 4½ inches and water cooled. The ignition is furnished by a Bosch dual magneto system. The oiling system is self-contained and a cone clutch is used. The frame is of channel steel with full elliptic front springs and platform springs in the rear. In the front there is a bracket which carries what might

is attached to a cross member at the rear, to the left frame member, and to another cross member in front. Timken bearings are used throughout.

Whitesides Truck—Capacity, 1,500 Pounds-1 Ton; Prices, \$1,600 to \$1,800.

The principal characteristic in the Whitesides trucks is the frame, which is of the armored variety. But one truck, of one ton capacity with stake body, is shown, although there are three sizes made by the company, which is located at Newcastle, Ind. The frame is of 2 by 4 inch white oak, with 3/16 inch armor plate on the sides, these being held to the wood by means of heavy wood screws frequently placed and staggered. The cross members are also

armored wood and are held to the side members by means of iron gusset plates attached to the cross members and the main side frames by wood screws. These plates are not right angle braces, but extend across the corners. The motor in the 1,500-pound car is $4\frac{1}{8}$ by $4\frac{1}{2}$ inches in dimensions and is carried on the main frame by means of arms in the usual manner. The cylinders are cast in a single block with a self-contained oil system and are of the L-head type. Valves are enclosed and two dis-

among the good points to be found on all the L-A-W models.

Stegeman Truck—Capacity, 1—6 Tons; Price—.

Excepting that there are as many different sizes of motors as there are models and that each model is built in proportion to the load designed to be carried, Stegeman construction is the same all the way through the entire line, with simplicity marking it at all points. Chassis are of

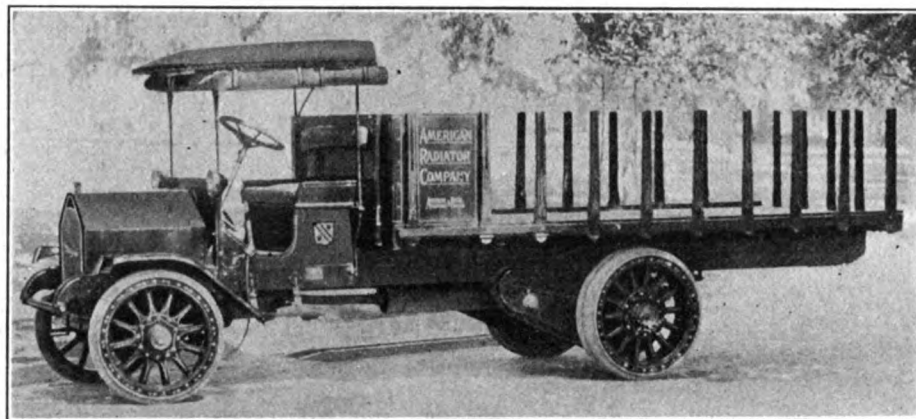
Dual tires are fitted to the rear wheels of all but the 1-ton model, which has single tires either solid or pneumatic and demountable rims.

International Wagon—Capacity, 1,000 Pounds.

The International is made by the International Harvester Co., in one chassis size and a number of body designs, those on exhibition being a department store delivery, express and open box wagons. The power plant is a two-cylinder air-cooled motor with $5\frac{1}{2}$ -inch bore and $5\frac{1}{2}$ -inch stroke, and is set longitudinally on a sub-frame under the body. Fans for cooling are arranged at the sides of the cylinders and are driven by belts from the flywheel. Ignition is effected by means of a Heinze magneto and timer, and dry cells. The transmission scheme embraces a planetary gear set with two forward speeds and chains from a countershaft. The frame is of angle iron, with necessary cross members. Full elliptic springs are used all through, these being 36 inches long and $1\frac{3}{8}$ -inch wide. There is a pedal operated differential brake and an emergency brake of the expanding type on the rear wheels.

Mogul Truck—Capacity 2, 4, 6-Tons.

Another Chicago maker of big trucks is the Mogul Motor Truck Co., which has a line of three sizes, 2, 4, and 6-tons capacity. On exhibition are a 6-ton lumber truck, with loading rolls and a 2-ton stake wagon with top. On the 6-ton are found 40 x 6-inch dual tires on the rear and 40 x 6-inch single front, these being interchangeable. The 2-ton has the same size wheels, but uses



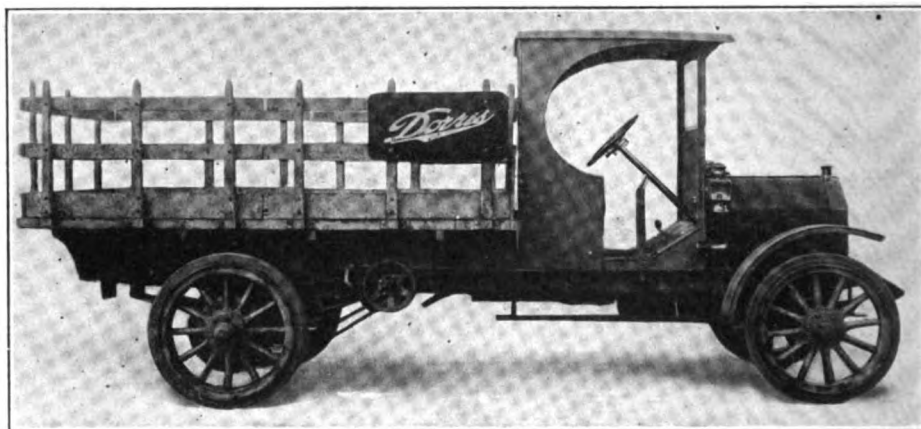
OPEN PLATFORM STAKE BODY ON STEGEMAN CHASSIS

tinct sets of ignition are to be found, a Splitdorf magneto supplying the current for all but starting. The transmission is connected with the jackshaft, which in turn is encased in a housing bolted to the side members of the frame. Final drive is through chains. In front, semi-elliptic springs are used, while the rear is supported by a platform, the cross member of which is carried under a cross member that is well braced. The Whitesides are made in a variety of bodies, though a single chassis, in which a planetary transmission is employed, with the control levers on the right side, is shown.

L-A-W Trucks—Capacity, 1, $1\frac{1}{2}$ and 2-Tons; Prices, \$2,200, \$2,400, \$2,800.

A special feature of the L-A-W truck is the final drive scheme, wherein the drive is through spur gears first, and then through the conventional bevel gear mechanism to the wheels. This is done to obtain gear reduction without enlarging the differential housing. In the three models made the same size motor is used, the difference in price being because of the different carrying capacities owing to different weights of material used. The motor has $3\frac{3}{4}$ -inch bore and 5-inch stroke and the cylinders are cast together. Cooling is effected by the thermo-syphon system and a radiator placed in front of the dash permits a Renault type hood to be used. Lubrication is by means of force feed through a hollow crankshaft and a dry plate disk clutch is used. The selective transmission, clutch and control unit are located in the center of the chassis, and a propeller shaft transmits power to the rear axle. Steel frames, semi-elliptic springs and large wheels are

extreme length, 80 per cent. of the load being carried on the rear wheels and the motor is placed as far forward as possible. All models carry four-cylinder motors, rated 30, 35, 35, 45 and 45-horsepower for the five models respectively. The frames are of channel steel, with the largest one trussed. Semi-elliptic springs are used front and rear, with an auxiliary cross



DORRIS TRUCK WITH PLATFORM STAKE BODY

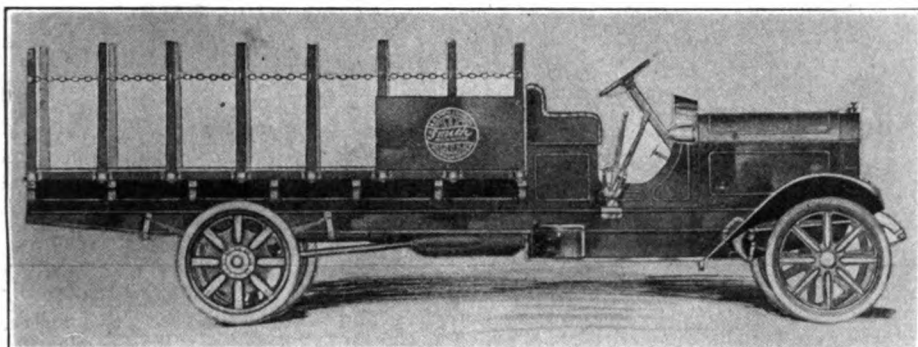
spring for the rear. The motor and transmission form a unit with a dry plate disk clutch a part thereof. The motor is suspended to the main frame and forms a compact power plant. A long propeller shaft transmits the power to a substantial jackshaft and encased chains are used for final drive. The cylinders are cast together with enclosed valve mechanism, self-contained oiling and the pump and magneto on the right side. The speed controlling lever and the emergency brake lever are located in the center, giving left-hand drive.

5-inch tires. All trucks are fitted with Timken axles and Continental motors of sizes to meet the load requirements, but there are a number of little essentials that are to be seen which would appear to be well thought-out designs. As an example, on the 4-ton truck the strut rod forward end has a yoke and an adjustment device at either end of it. The entire rod is heavier than that ordinarily used. There is, too, a little scheme to do away with extra long spring clip belts. This is accomplished by locating the spring clip on an extended

bracket which is rigidly fixed to the spring seat.

The 2-ton model has a block motor $4\frac{1}{2} \times 5\frac{1}{4}$ inches, while the 4-ton uses a T-head motor $5 \times 5\frac{1}{4}$ inches with separately cast cylinders. The 6-ton has a similar motor, but the dimensions are $5\frac{1}{4} \times 5\frac{3}{4}$ inches. Hele-Shaw clutches are used on all models. Mogul frames are heavy, well

the large torsion tube and is connected with the worm, this in turn being meshed with the worm on the differential. From the axle housing, which is made a unit with the torsion tube, there extend two strut rods to eyes on the under side of the transmission case, these rods being of tubing of large diameter and being pinned to the eyes.



A. O. SMITH WORM-DRIVEN TRUCK, RIGHT HAND SIDE

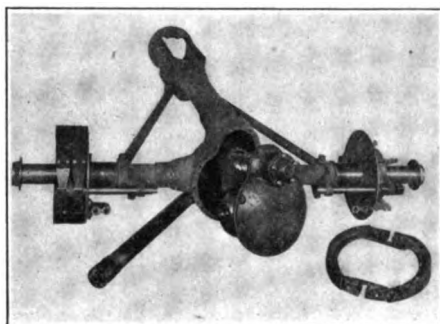
reinforced at corners and where cross members are used and in addition there is a bumper in front to protect the radiator.

A. O. Smith Truck—Capacity 5 Tons.

More individuality is shown in the new truck of A. O. Smith of Milwaukee than in anything that has been produced in the past several years; as a matter of fact there is nothing conventional about this 5-ton truck except the motor itself, which is a Continental of the L-head type with a bore of $4\frac{1}{2}$ and a stroke of $5\frac{1}{2}$ inches. The frame, wheels, radiator, transmission, shaft housing—all show individuality of startling proportions. In the first place, the frame is not only massive, being of 7-inch section, but it is pressed with a beaded channel and a concave surface. Even the cross members are different from those commonly used, for they are of the overhead yoke type and serve also to carry the spring hangers.

The transmission and rear system are a unit, and are so designed that there is absolutely a straight line to the drive, which is by worm. The transmission housing at the forward end is an enlargement of the what would be a torsion tube, with the top opened and the front end designed to be bolted to the ball and socket joint attached to a cross member. The transmission proper is long and deep and has herringbone gears. It is not of the selective type but rather of the Cotta type, or so arranged that all gears are in mesh at all times the speed changes being made through the medium of individual dog clutches. The top of the transmission case is used as a hanger for the shifter rods, the latter being held in place by being supported by hangers at either end and the middle. On the top is a lifting ring, and the design is such that the engine transmission may be removed without even disturbing a single gear. The drive shaft extends through

The brake system comprises double expanding brakes which are adjustable by means of wing nuts on the outside. The brake rods are pressed steel of inverted U-



SMITH WORM CONSTRUCTION

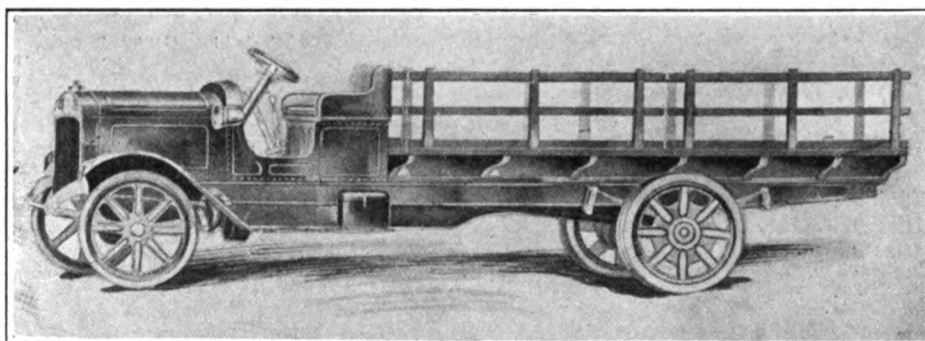
shape and heavy section, which operate shafts with cams to spread the brake bands. The wheels are of cast steel and are carried on Bower bearings. They are of hol-

low section and outwardly give the appearance of being round in the spokes; as a matter of fact, however, the spokes flare at the point of joining the felloe. The latter is, of course, cast with the other parts. Demountable rims are used exclusively. The back wheels are of different design from

the front, but in general are the same, except that they are made for dual tires and have as a consequence larger spokes, and of greater flare at the felloe. Even the seats are of steel, as is the dash, and in fact all other parts. The radiator is of the vertical tube copper variety, with the water reservoirs top and bottom and the tubes so arranged that with very little work the tubes may be removed for a repair. The motor and radiator are arranged on the same sub-frame, so that there is no opportunity for the latter to be racked to any extent. The motor has a cone clutch, double ignition system, with Bosch magneto and a throttle governor. In addition to a chassis there is shown a stake wagon truck and a transmission with cover removed.

Service Truck — Capacity, 1,500-2,000 Pounds.

With the exception that the parts of the ton truck are larger and heavier than the 1,500-pound, the Service trucks, made by the Service Motor Car Co., of Wabash, Ind., are practically alike, and only the one-ton model is displayed. This is one of the few friction drive trucks on exhibition, and is fitted with a Rutenber motor with cylinders $3\frac{3}{4}$ by $5\frac{1}{4}$ inches in bore and stroke, the motor being mounted by arms to the side members of the main frame. The magneto and pump on this motor are placed in front and are driven by a cross shaft, which in turn is operated by a bevel gear. The disposition of the motor and radiator is conventional, but the chief attraction is found in the double friction disk transmission scheme, which as a unit is supported by an overhead yoke and two cross members to support the bearings of the driving disks. The shifting device is attached to the overhead yoke, with a long rod reaching to the operating lever at the side of the driver. The two driven disks are operated by means of a foot pedal and are held against the driving disks by heavy springs and a tightener in case



A. O. SMITH WORM-DRIVEN TRUCK, LEFT HAND SIDE

the load pull exceeds the holding ability of the springs. Something of a novelty—one which should naturally appeal to the agriculturist using such a truck—is a pulley located back of the frame in the center, to which a belt may be applied for use to drive a corn sheller, feed chopper or other

implement. The pulley is operated by means of a shaft from the back driving pulley and is supported by means of bearings attached to the frame at the back. The truck on exhibition is fitted with semi-elliptic springs all around, with chains for final drive and large-sized solid tires.

Harder Truck—Capacity, 1½, 2, 3, 5 Ton; Prices \$2,250—\$4,400.

There are two or three exceptionally noteworthy features embodied in the design of the Harder trucks, made by the Harder Auto Truck Co., of Chicago, which has an exhibit consisting of a 2-ton stake wagon with single tires, a 3-ton storage-furniture van and a 2-ton chassis fitted out as a combination chemical-fire wagon for the city of Chicago. The rear spring suspension is of the platform type, except that instead of a cross spring at the rear there is what is termed an equalizing traction bar, this being swiveled in the center of the frame and the ends being hung to the spring shackles, so that the tendency is for the floor of the truck to retain a horizontal position when one wheel drops into a hole. The other feature is a swinging radiator, hinged on the left side. By uncoupling the hose in two places the radiator may be swung around so as to permit access to the motor in case any great amount of work is required. Harder trucks are massive in construction with heavy semi-elliptic springs in front. Heretofore the Harder people used a progressive type transmission, but they have recently designed a compact selective type, with the transmission speed change gears in a separate compartment from the differential yet using the same case.

In all cases the motor on the Harder trucks is suspended on a subframe, but by swinging the radiator outward the motor may be removed from the chassis with little difficulty. No fewer than four sizes of motors are used in the trucks—4 x 4, 4¼ x 4¾, 4¾ x 5, 5 x 6—but in design there is little difference. In all models vertical tube radiators are used, as well as Mea magnetos. The motor has a self-contained oiling system and large inspection plates, so that it is readily accessible. The clutch is a departure from ordinary practice, although it might be called a happy medium between the cone and disk. It is in reality a multiple cone, with 15 cone-shaped plates for friction surfaces.

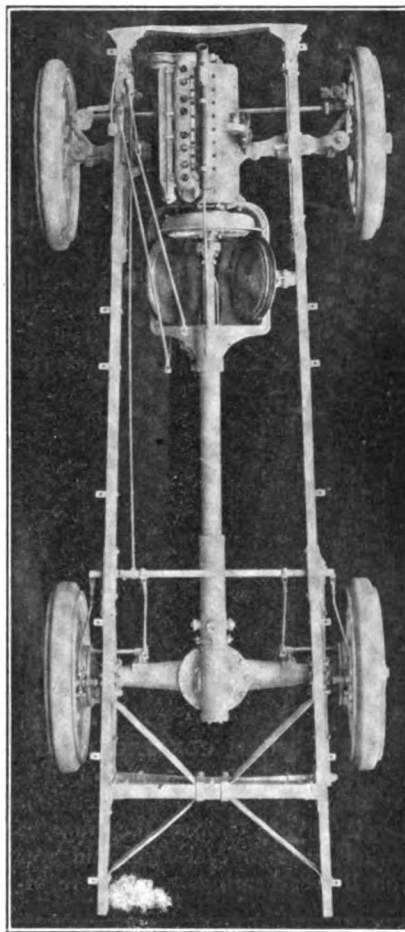
Little Giant Truck—Capacity, 1 Ton.

The Little Giant is made by the Chicago Pneumatic Tool Co. in only one size. The cars on exhibition comprise a department store delivery wagon, express stake body and a specially designed car for carrying bottled goods. The motor is of the two-cylinder opposed type with 5-inch bore and 4-inch stroke, set crosswise of the frame and with the planetary transmission a part of the power plant. A rectangular subframe of angle steel carries the power

plant. Full elliptic springs are used throughout.

Great Dain Truck—Capacity, 1 Ton.

Something of a decided novelty and of extreme simplicity is found in the Great Dain, made by Joseph Dain, of Ottumwa, Ia. It comprises a four-cylinder power plant, friction transmission and a worm drive that, altogether, has three points of support, with two of these trunnioned. In addition the maker has devised a very simple yet effective scheme for bracing the cross member which carries the auxiliary cross spring. In the first place, the four-



GREAT DAIN CHASSIS

cylinder block Wisconsin motor, of 3¾ by 5½ inches, with K-W magneto for ignition, is supported on the main frame members by two trunnions that are amidship the motor, so that the latter is practically perfectly balanced. The transmission scheme is made a part of the motor, or forming a unit power and transmission plant. The transmission consists of two disks set at an angle to each other, which on low speed or reverse are rotated by the rim of the flywheel being brought into frictional contact with their edges. A friction wheel slideably connected with the propeller shaft and mounted between the disks, receives the power from the face of the disks. When shifting the friction wheel across the face of the disks or to disengage the power when using transmission, the driver

may by a simple movement of the foot, lift the friction wheel out of engagement with the disks and thereby release the contact between the friction wheel and the face of the disks. The disks being mounted with their face at an angle to each other, or in other words, the friction wheel being in wedging contact with the face of the disks, makes it possible to relieve the frictional contact by lifting the friction wheel instead of moving the disks.

To shift from low to high speed, or in other words, from transmission to direct drive, the friction wheel which carries one member of a cone clutch is moved out of contact with the face of the disks and into engagement with the other member of a cone clutch formed in the flywheel. Doing this moves the flywheel out of contact with the edges of the disks leaving them idle. To disengage the power when on direct drive, the clutch can be released by the foot lever. Another well merited and advanced feature of construction is the three-point suspension of the unit power plant whereby the power at all times is transmitted from the engine directly to the rear axle in a straight line, no universal joints being used. The drive shaft is encased in a tube and has a slip joint near the back end. The torque is cared for by this tube and there are means of taking this away from the drive shaft by means of buffers located immediately in front of the back axle. The tube, by the way, is arranged with a slip joint so as to prevent tendency of transmitting radial strains through the transmission or the motor. The final drive is through a worm, in direct line with the shaft and motor. The back cross member carrying the auxiliary cross spring is braced on either side to each frame member by pressed steel straps concaved to add strength and rigidity. The axle itself is of the semi-floating type and the frame is carried on semi-elliptic springs in front and platform springs in the rear. The frame is made of channel steel and contains a wood filler, adding stiffness to the car and preventing the liability of permanent set.

Diamond T Trucks—Capacity, 3 and 5 Tons; Prices, \$3,250—\$3,350.

The Diamond T Motor Car Co. shows a 5-ton chassis and a 5-ton stake truck made for the L. Wolff Mfg. Co. While the Diamond T is not radical in any sense it shows substantial construction and is of simple and business-like design all through, the frame being heavy and well braced at vital points. The motor is supported on a subframe, and heavy plates are set between the subframe and the main frame, acting as braces and pans at the same time. The power plant comprises a 5 x 5½-inch motor with the cylinders cast in pairs, and having enclosed valve mechanism, Bosch dual ignition system, disk clutch of steel plates running in an oil-tight case. The transmission is of the three-speed selective type,

hung on the subframe, with universal joints interposed between the motor and transmission. The final drive is by propeller shaft to a Timken jackshaft, and through chains to the rear wheels. Both rear and front axles are of Timken construction, with 36 x 6-inch demountable tires, dual in the rear. The frame is pressed steel of 7-inch section, and gives a 14-foot loading space. The wheelbase is 144 inches on the 5-ton model. The 3-ton truck carries the same specifications except that the springs are lighter and the tires are 36 x 5 inches.

Utility Truck—Capacity, 1 and 3 Tons; Price, \$2,000—\$3,500.

This is another Milwaukee truck, of conventional design all through except the transmission, which is of the friction disk type. It formerly was called the Stephenson, and is made by the Stephenson Motor Car Co., control of which only last week was acquired by the big J. I. Case Threshing Machine Co. The motor has a bore of $4\frac{1}{4}$ inches and a stroke of 5 inches, being of the T-head type. It is mounted on the main frame through arms from the motor base and well back, the driver's seat being over it, and the steering wheel being in front of it. A long propeller shaft connects the motor and the driving disk of the friction transmission, the latter being supported on a cross member. The other driving disk also is supported by a cross member and the movable driven disks are carried on a jackshaft which in turn carries the sprockets from which power is transmitted to the rear wheels by chains. The steel frame has straight lines all the way, being supported by semi-elliptic front and platform rear springs, the latter having the cross spring directly under the back frame member. The wheels are 42 inches in diameter and 5-inch tires are used. These figures apply to the larger car, and of course the smaller one is of smaller dimensions, although there is no change in design. In the 3-ton truck the motor is $4\frac{3}{4}$ x $5\frac{1}{2}$ inches, but of the same design as the smaller one.

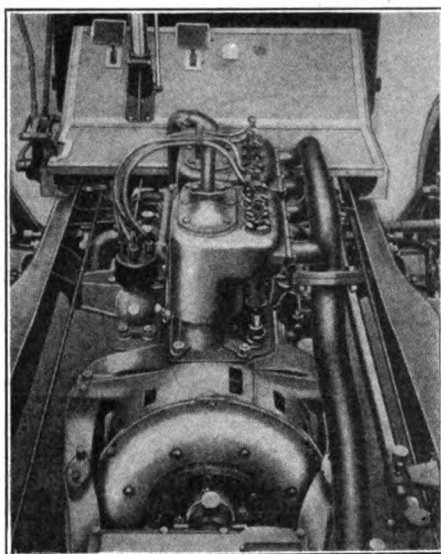
Monitor Truck—Capacity, 1,500 Pounds; Price, \$1,600.

Three vehicles constitute the exhibit of the Monitor Automobile Works of Janesville, Wis.—a chassis, a stake wagon and one with an express body. The express wagon is particularly well designed, having the driver's seat occupying the right half of the forward end, while the other side is left entirely open, giving ample room to carry such things as ladders, pipe, etc. The monitor has an opposed motor of two cylinders rated at 20-horsepower carried on a subframe, to which also is bolted the planetary two-speed transmission. Unlike most of the cars employing planetary transmissions, the Monitor has shaft drive, the propeller shaft being within a housing which acts as a torsion tube. The frame is pressed steel of channel section, 122 inches long

and $4\frac{1}{2}$ -inch section. Full elliptic springs are used all around and the wheelbase is 100 inches. The steering wheel is located well forward, with the spark and throttle levers on top. The speed change levers are on the footboard for low and reverse, and a hand lever at the side for high. Ignition is effected by means of a Bosch magneto and coil system. The model C or 1-ton truck has a large two-cylinder motor, with selective transmission, shaft drive, a centrifugal governor, and cone clutch.

Philadelphia Truck — Capacity, 1,500 Pounds—3 Tons; Price, \$2,150—\$3,400.

The merchant desiring a handy 1,500-pound car as a utility car and with a little advertising thrown in found all this in a late comer, the Philadelphia, made by the Philadelphia Truck Co. At first glance



PENNSYLVANIA SELF-STARTING ENGINE

it appears conventional in more ways than one, but after close inspection the conventionalism wears off. The power plant in itself is not out of the ordinary, being a four-cylinder Peru Model motor, rated at 25-horsepower, and supported at three points on the chassis frame. The motor is one of the very latest models to be added to the extensive Peru line—in fact, it was exhibited for the first time during the pleasure car part of the present exhibition in the Armory—and is quite different from anything else in that it incorporates a starter and a generator that is an integral part of the engine. It is a special motor-generator which takes the place of the ordinary flywheel, the functions of which are performed by the field of the generator. It is so encased that there is little likelihood of water, or oil, or dirt, getting into it. This charges, while the motor is running, a 24-volt battery carried in a heavy box under the body and is provided with an automatic cut-out. A foot button is arranged near the seat, so that by pressing this the electric motor is started and, being direct connected, revolves the motor as long as there

is current and a contact is made at the push button. In addition, the battery supplies current for a complete lighting plant, even to a splendidly designed sign arranged on the sides of the top, making a most effective advertising scheme. It is claimed that the electric motor will revolve the gasoline motor at last 7,000 times, so that in case of running out of fuel the car may be driven some distance if necessary. The motor is suspended to the frame by two arms in the front and, being a unit with the transmission, is supported at the back end of the transmission by a ball and socket joint attached to a cross member. The frame is of pressed steel and rests on semi-elliptic front and three-quarter-elliptic rear springs. The wheelbase is 112 inches and the weight of the chassis 2,100 pounds. In addition the company is putting out a 3-ton truck of the same design, but in larger proportions all the way through.

Clark Truck—Capacity, 1 Ton; Price, \$2,000 for Chassis.

The Clark is a Chicago-made truck with a 1-ton chassis, the cars exhibited being a Pullman stake, station with screened top, and a dairy stake wagon. The Clark of 1912 shows much refinement in matters of detail, although the general design has not been altered. This is conventional yet simple, the motor and transmission being mounted on a subframe which is supported by two cross members. The motor is $3\frac{3}{4}$ x 5 inches, with four cylinders cast in a single block, and cooled by water. There is a self-contained oiling system, the oil being pumped to all parts through a hollow crankshaft. A multiple disk clutch running in oil is used and between the motor and transmission are two universal joints. The motor is of the L-head type, with the valve springs enclosed. A selective type transmission, with individual clutches is used, the gears being in mesh at all times, and idle when high gear is used.

A full floating rear axle with a 6 2-3 to 1 gear ratio is used, and this has internal expanding brakes. The front axle is I-beam, with roller bearings throughout. The frame is pressed steel, well braced in the rear, gussets being liberally used. The frame is supported by half elliptic front and full elliptic rear springs. A special drawbar is provided, when ordered, so that a trailer may be used if desired.

Schmidt Truck—Capacity, $\frac{1}{2}$ and 1 Ton; Price, \$975 to \$1,375.

The Schmidt truck is one of those small power wagons that because of simplicity and size naturally must appeal to the small merchant on account of ease of operation and small upkeep. It is one of the few that uses an air cooled motor of the two-cylinder type and planetary transmission. The motor is placed lengthwise of the car and has cylinder dimensions of $4\frac{1}{4}$ inches bore by 5 inches stroke. The motor and trans-

mission are together and are disposed below the frame in a special subframe located practically in the center of the frame. The magneto is located on the left side and is accessible upon removing a sheet iron side plate, which also gives access to the carburetter. As a matter of fact all the parts needed to be reached are instantly reached when this side plate is removed. The power plant can be lowered by removing the bolts that attach the subframe to the main frame, and so complete is the removal process that the motor and transmission may be placed on a bench and run so long as fuel is supplied. The frame is of channel section and, out of the ordinary, is supported in front by three-quarter springs, while half-elliptic and spiral springs are employed in the rear, a turn about from pleasure car practice. In the control devices the reverse and low speeds are effected by operating a foot pedal, while high is obtained by means of a hand lever on the steering column under the wheel, similar to the gear shift lever on the old Pierce-Arrow cars. On the one ton truck 36 inch wheels are used in front, while 38 inch wheels are to be found for driving purposes. In the 1,000-1,500 pound truck the motor is rated at 18 horsepower, while in the 1-ton truck the power is placed at 20. The general design is the same, although dimensions are increased for the larger size. These trucks are made by Schmidt Bros. Co., of Chicago.

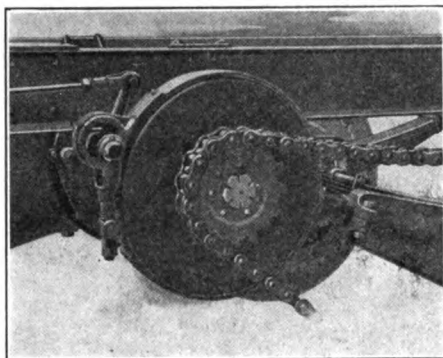
Bessemer Truck—Capacity 1 Ton; Price, Chassis, \$1,800.

This is a conventional 1-ton truck marked by simplicity and which hails from Grove City, Pa. It has no unusual features, having a $3\frac{3}{4} \times 5\frac{1}{4}$ -inch Continental motor with Bosch dual ignition system and an American starting device. Power is transmitted through a three-speed selective transmission to a jackshaft bolted to the frame and thence through chains to the rear wheels. The spring hanger and end of the jackshaft housing are integral. The design of this part of the car is such that the jackshaft may be removed in 10 minutes, by the removal of a couple of bolts and a cap. Platform springs are employed in the rear and semi-elliptics in front. It is worthy of note that the spring pads are made integral with the axle housing in the rear and the axle proper in front. Both contracting and expanding brakes are used, the former being $14 \times 2\frac{1}{4}$ inches, and the latter $13\frac{1}{2} \times 2\frac{3}{4}$ inches. The frame is of pressed steel, and of sufficient length to give 107-inch wheelbase. As is the case with many of the smaller cars this year, the Bessemer has a left-hand steering wheel and center control.

Old Reliable Truck—Capacity, $3\frac{1}{2}$ Tons; Price, \$4,000.

A stake wagon and a chassis in all aluminum are shown by this comparatively new Chicago house, the Henry Lee Power Co.

The Old Reliable is not only massive looking, but is massive, having the appearance of a 5-ton vehicle; in fact, it is used as a 5-ton truck. The motor is of T-head construction, cylinders measuring $4\frac{3}{4} \times 5\frac{1}{2}$ inches, and is carried on a subframe, with a long drive shaft connecting the disk clutch and the selective transmission located adjacent to the jackshaft housing, which in turn is bolted to the under side of the frame. In addition to the support given the transmission through the jackshaft housing the forward end of the transmission case is bolted to a heavy cross member that is especially braced with gussets. Back of the jackshaft and immediately over the back axle there is another cross member and, of course, there is one at the end of the frame. The motor is placed under the seat and floor boards, but it is arranged so that it may be easily removed inasmuch as the



OLD RELIABLE BRAKE MECHANISM

radiator is supported on trunnions and the bumper cross member is bolted and may be easily removed in a few moments. The weight of the parts carried on the frame is well distributed, so that 65 per cent. of the load is carried on the rear wheels.

One of the features of the truck, outside of the extreme accessibility, is the eccentric brake operating scheme. It has a take-up to compensate for wear of the eccentric and the brake bands also are provided with means for adjustment. The motor is of the T-head type, with a self-contained oiling system, large valves, a governor and two systems of ignition.

Premier Truck—Capacity, $1\frac{1}{2}$ Tons.

The Premier Motor Co., of Indianapolis, has begun its truck-making career by bringing out a large delivery wagon that has all of the Premier earmarks of quality. The "4-40" motor that is regularly used is fitted to a heavier frame and one that gives a wheelbase of 131 inches. In addition the rear axle is materially larger and heavier than that used on the pleasure cars, although of exactly the same design with the exception that strut rods are used on the commercial car. On the truck shown dual pneumatic tires are fitted, but one of the options is solid tires. Semi-elliptic springs are used all around, whereas on the touring cars three-quarter elliptics are used.

Considerable attention was drawn to the Premier headquarters by the Premier with prairie schooner top which acted as baggage and mechanical wagon on the Coast-to-Coast Premier tour last season.

Sternberg Trucks—Capacity Range, 2—6 Tons; Price Range, \$2,850—\$4,750.

Though manufacturing trucks in four sizes—2, 3, 4 and 6 tons—the Sternberg Mfg. Co., of Milwaukee, Wis., shows but one chassis, that of the 4-ton vehicle. As the design and the constructional features are precisely alike throughout the line, however, the dimensions only differing, the single exhibit answers perfectly for all. Motors are of the long stroke type, that in the chassis shown measuring $4\frac{1}{2} \times 6\frac{3}{4}$ inches, and are designed to run at slow speed, the logical result being long life and a minimum of trouble. Drive is through a heavy duty Evans clutch of the Hele-Shaw type, individual clutch change-speed gear with selective control carrying the differential in a rearward extension of the housing, and jackshaft, and side chains to the rear wheels. Motor and gearbox are carried at opposite ends of a long steel subframe, which also carries the intermediate bearings for the jackshaft. Jackshaft and wheels all are mounted on Timken roller bearings. In the construction of the main framing steel with wood filling is used, the object being the prevention of crystallization. In all the Sternberg trucks the speed is automatically governed, so that there is no chance for a reckless driver to do damage by high speed methods.

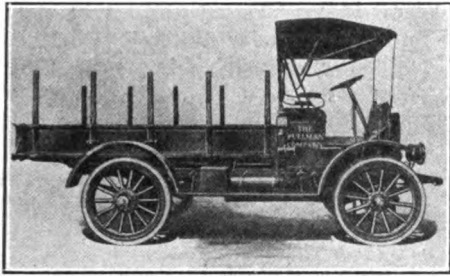
Equipment is the same for all sizes and consists of electric side and tail lamps, 120-180 ampere-hour storage battery, Klaxonet electric horn, hub odometer and the usual tools and jack.

Staver Truck.

So far the Staver Carriage Co. has confined its energies to making pleasure cars, but having recently brought out a special ambulance job it decided to exhibit it, and as a result it has been forced into the truck end of the business, as this car brought orders for others, including a hearse. The splendid job of ambulance body design exhibited is fitted to a chassis of Staver make, but made heavier and larger all the way through, although the regular 40-horsepower motor and selective transmission are used. The body is fitted with all first aid appliances, and in addition to a cot of wickerware has another arranged to be suspended from the roof, so that two patients may be carried at the same time. This car is fitted with 36-inch by 5-inch pneumatic tires, and a much heavier rear axle than that used on pleasure cars. The motor is cast in a block and is $4\frac{3}{8} \times 5\frac{1}{4}$ inches; a disk clutch is used and the transmission is selective.

Sandusky Truck.

The chief feature about the Sandusky truck, which is made at Sandusky, O., is



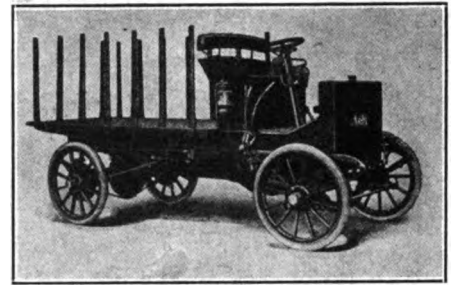
CLARK DELIVERY CAR

that the motor and radiator are arranged on a frame so they may be slipped out of the chassis for any work to be done.

Adams Trucks—Capacity, 1 Ton; Price, \$2,100.

A most accessible motor, of good design and showing modern practice all through, is found in the Adams 1-ton truck, which is shown in the Coliseum in chassis, and with station wagon, express and stake bodies. While the other parts have the appear-

ance of being more or less conventional, the motor is a little out of the ordinary in that the magneto and pump shaft is in front and crosswise, with the magneto on the left and the pump on the right side. The motor is $3\frac{7}{8}$ by 5 inches in cylinder dimension; and is cast in a single block; it is of the L-head type. The power plant is simple, being arranged with a self-contained return oiling system, fan in the flywheel, Eisemann dual magneto and a Wells expanding disk clutch that is hidden in the hub of the flywheel. The motor is mounted on a subframe and a long propeller shaft connects the change speed mechanism, which is supported in front by a single cross member from one point and at two points on another cross member at the rear, the jackshaft bearings being bolted to the under side of the frame members. The transmission has F & S ball bearings, while the jackshaft is carried on Hess-Bright bearings. Radius rods are fitted to the jackshaft bearing extensions. The control is in the center, with the steering wheel on



THE MONITOR TRUCK

the left side and the spark and throttle levers on the steering column. Semi-elliptic springs are employed all around, with substantial spring hangers. The radiator is not placed in front, but is in front of the dash, with a Renault type hood hinged on the dash, making access to the motor extremely easy. The radiator is of the vertical tube type and has two filler caps, one on each side, and in addition cooling is effected with the aid of a centrifugal pump operated from the magneto shaft.

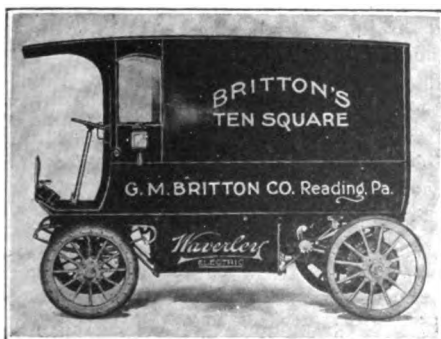
Summary of the 81 Exhibits of Commercial Motor Vehicles

Exhibitors marked with an asterisk (*) did not exhibit at New York shows.

Adams Bros. Co., Findlay, Ohio—Four four-cylinder Adams vehicles.*
Alden-Sampson Mfg. Co., Detroit, Mich.—Three Sampson vehicles: one two-cylinder and two four-cylinder cars and two four-cylinder chassis.
American Locomotive Co., New York City—Three four-cylinder Alco vehicles and one four-cylinder chassis.
Atterbury Motor Car Co., Buffalo, N. Y.—Three four-cylinder Atterbury vehicles.
Autocar Co., Ardmore, Pa.—Three two-cylinder Autocar vehicles and one two-cylinder chassis.
Avery Co., Peoria, Ill.—Three Avery four-cylinder vehicles.*
Bessemer Motor Truck Co., Grove City, Pa.—One four-cylinder Bessemer vehicle.*
Blair Mfg. Co., Newark, Ohio—One four-cylinder Blair chassis.*
Bowling Green Motor Car Co., Bowling Green, Ohio—One four-cylinder Modern vehicle.
Brush Runabout Co., Detroit, Mich.—Two

CENSUS OF THE SHOW	
Total Exhibitors	222
Exhibitors of Vehicles.....	81
Exhibitors of Accessories...	124
Exhibitors of Motorcycles..	17
Gasolene Commercial Vehicles.	
One Cylinder	4
Two Cylinders	32
Three Cylinders	5
Four Cylinders	111
Six Cylinders	1
Total Gasolene Vehicles.....	153
Gasolene Chassis.	
One Cylinder	1
Two Cylinders	9
Three Cylinders	1
Four Cylinders	45
Total Gasolene Chassis.....	56
Electric Vehicles	11
Electric Chassis	6
Motorcycles	82
Grand Total Vehicles and Chassis	308

—Three two-cylinder Little Giant vehicles and one two-cylinder chassis.*
Clark Delivery Car Co., Grand Crossing, Chicago—Three four-cylinder Clark vehicles and one four-cylinder chassis.*
Commerce Motor Car Co., Detroit, Mich.—Two four-cylinder Commerce vehicles and one four-cylinder chassis.
Dain, Joseph, Ottumwa, Iowa—One four-cylinder Great Dain chassis.*
Dart Mfg. Co., Waterloo, Ia.—Two two-cylinder Dart vehicles.
Dayton Auto Truck Co., Dayton, Ohio—One four-cylinder Dayton vehicle and one four-cylinder chassis.
Diamond T. Motor Car Co., Chicago, Ill.—One four-cylinder Diamond T vehicle and one four-cylinder chassis.*
Dorris Motor Car Co., St. Louis, Mo.—One four-cylinder Dorris vehicle and one four-cylinder chassis.*
Durant-Dort Carriage Co., Flint, Mich.—One two-cylinder Best vehicle and one two-cylinder chassis.



WAVERLEY ELECTRIC DELIVERY

single-cylinder Brush vehicles and one single cylinder chassis.

Buick Motor Co., Flint, Mich.—Seven two-cylinder Buick vehicles and one two-cylinder chassis.

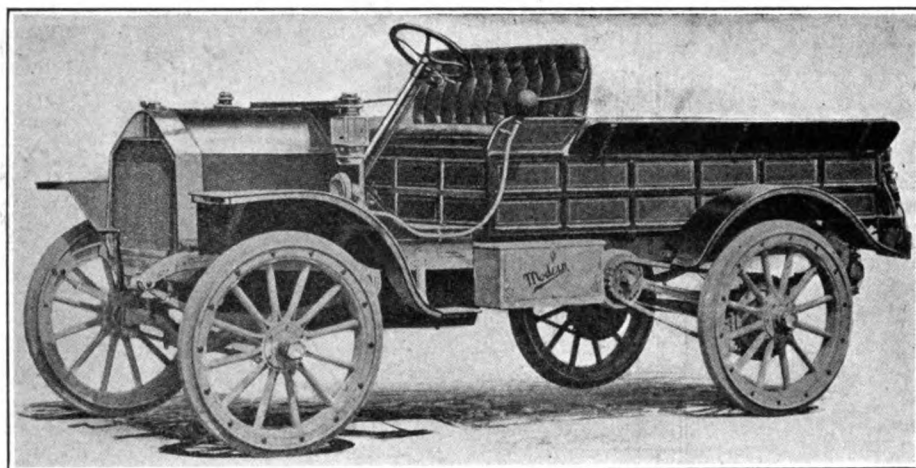
Cartercar Co., Pontiac, Mich.—Two two-cylinder Cartercar vehicles.

Chase Motor Car Co., Syracuse, N. Y.—Four three-cylinder two-cycle Chase air-cooled vehicles.

Chicago Pneumatic Tool Co., Chicago, Ill.



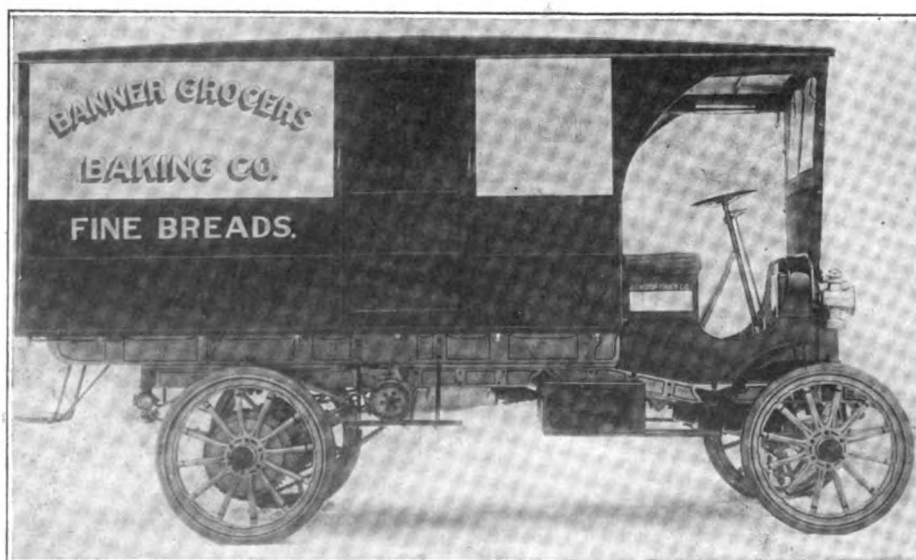
THE BRUSH DELIVERY CAR



THE "MODERN" 1,500-POUND OPEN EXPRESS TRUCK



SPECIAL DAIRY BODY ON PACKARD THREE-TON CHASSIS



THE 1½-TON MODEL U. S. MOTOR TRUCK

Federal Motor Truck Co., Detroit, Mich.—Two four-cylinder Federal vehicles and one four-cylinder chassis.

Garford Co., Elyria, Ohio—Three Garford four-cylinder vehicles and one four-cylinder chassis.

General Motors Truck Co., Detroit, Mich.—Ten four-cylinder G. M. C. vehicles and three four-cylinder chassis.

Grabowsky Power Wagon Co., Detroit, Mich.—Three four-cylinder Grabowsky vehicles and one four-cylinder chassis.

Gramm Motor Truck Co., Lima, Ohio—Three four-cylinder Gramm vehicles and one four-cylinder chassis.

Harder Auto Truck Co., Chicago, Ill.—Two four-cylinder Harder vehicles.*

Harwood-Barley Mfg. Co., Marion, Ind.—One four-cylinder Indiana vehicle.*

International Harvester Co. of America, Chicago, Ill.—Three two-cylinder I. H. C. vehicles.*

International Motor Co., New York City—(Saurer and Mack). Four four-cylinder International vehicles and two four-cylinder chassis.

Jeffery Co., Thomas B., Kenosha, Wis.—One four-cylinder Rambler vehicle.

Kelly Motor Truck Co., Lima, Ohio—Four four-cylinder Kelly vehicles and one four-cylinder chassis.

Kissel Motor Car Co., Hartford, Wis.—Four four-cylinder Kissel vehicles and one four-cylinder chassis.*

Knox Automobile Co., Springfield, Mass.—Two Knox vehicles, one four-cylinder and one six-cylinder, one four-cylinder tractor and two four-cylinder chassis.

Lauth-Juergens Motor Car Co., Freemant, Ohio—Two four-cylinder Lauth-Juergens vehicles.

L. A. W. Motor Truck Co., Findlay, Ohio—One four-cylinder L. A. W. vehicle.*

Lee Power Co., Henry, Chicago, Ill.—One four cylinder Old Reliable vehicle and one four-cylinder chassis.*

Locomobile Co. of America, Bridgeport, Conn.—One four-cylinder Locomobile vehicle and two four-cylinder chassis.

Lozier Motor Co., Detroit, Mich.—One four-cylinder Lozier chassis.

McIntyre Co., W. H., Auburn, Ind.—Two four-cylinder McIntyre vehicles.

Mercury Mfg. Co., Chicago, Ill.—Three two-cylinder Mercury vehicles.*

Mogul Motor Truck Co., Chicago, Ill.—Two four-cylinder Mogul vehicles.*

Monitor Motor Works, Janesville, Wis.—Two two-cylinder Monitor vehicles and two two-cylinder chassis.*

Motor Wagon Co., of Detroit, Mich.—Three two-cylinder two-cycle Detroit vehicles and one two-cylinder chassis.

National Motor Truck Co., Bay City, Mich.—One four-cylinder Natco vehicle and one four-cylinder chassis.*

Packard Motor Car Co., Detroit, Mich.—Five four-cylinder Packard vehicles and one four-cylinder chassis.

Packers Motor Truck Co., Wheeling, W.

Va.—One four-cylinder Packers vehicle and one four-cylinder chassis.

Peerless Motor Car Co., Cleveland, Ohio—Two four-cylinder Peerless vehicles and one four-cylinder chassis.

Philadelphia Truck Co., Philadelphia, Pa.—One four-cylinder vehicle.*

Pierce-Arrow Motor Co., Buffalo, N. Y.—Two four-cylinder Pierce-Arrow vehicles and one four-cylinder chassis.

Pope Mfg. Co., Hartford, Conn.—One four-cylinder Pope-Hartford vehicle and one four-cylinder chassis.

Poss Motor Co., Detroit, Mich.—One four-cylinder Poss vehicle and one four-cylinder chassis.

Premier Motor Mfg. Co., Indianapolis, Ind.—Three four-cylinder Premier vehicles.*

Reo Motor Car Co., Lansing, Mich.—Two single-cylinder Reo vehicles.

Sandusky Auto Parts and Motor Truck Co., Sandusky, Ohio—Two four-cylinder Sandusky vehicles.*

Sanford-Herbert Co., Syracuse, N. Y.—One three-cylinder air-cooled two-cycle Sanbert vehicle and one three-cylinder chassis.

Schacht Motor Car Co., Cincinnati, Ohio—One four-cylinder Schacht vehicle and one two-cylinder chassis.

Schmidt Bros., Chicago, Ill.—Two two-cylinder air-cooled Schmidt vehicles and one two-cylinder chassis.*

Service Motor Car Co., Wabash, Ind.—One four-cylinder Service vehicle and one four-cylinder chassis.*

Smith Co., A. O., Milwaukee, Wis.—One four-cylinder Smith chassis.*

Speedwell Motor Car Co., Dayton, Ohio—Two four-cylinder Speedwell vehicles and two four-cylinder chassis.

Staver Carriage Co., Chicago, Ill.—One four-cylinder Staver vehicle.*

Stearns Co., F. B., Cleveland, Ohio—One four-cylinder Stearns chassis.

Stegeman Motor Car Co., Milwaukee, Wis.—Two four-cylinder Stegeman vehicles and one four-cylinder chassis.*

Stephenson Motor Car Co., Milwaukee, Wis.—Two four-cylinder Utility vehicles.*

Sternberg Mfg. Co., Milwaukee, Wis.—One four-cylinder Sternberg chassis.*

U. S. Motor Truck Co., Cincinnati, Ohio—One four-cylinder U. S. vehicle and one four-cylinder chassis.*

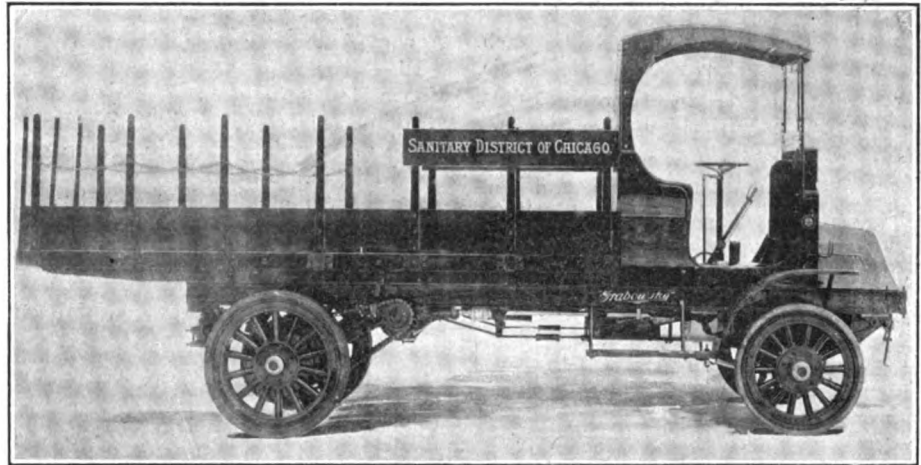
Velie Motor Co., Moline, Ill.—One four-cylinder Velie vehicle and one four-cylinder chassis.

White Co., Cleveland, Ohio—Six four-cylinder White vehicles and one four-cylinder chassis.

Whitesides Commercial Car Co., New Castle, Ind.—One four-cylinder Whitesides vehicle.*

Wilcox Motor Car Co., H. E., Minneapolis, Minn.—One four-cylinder Wilcox vehicle and one four-cylinder chassis.*

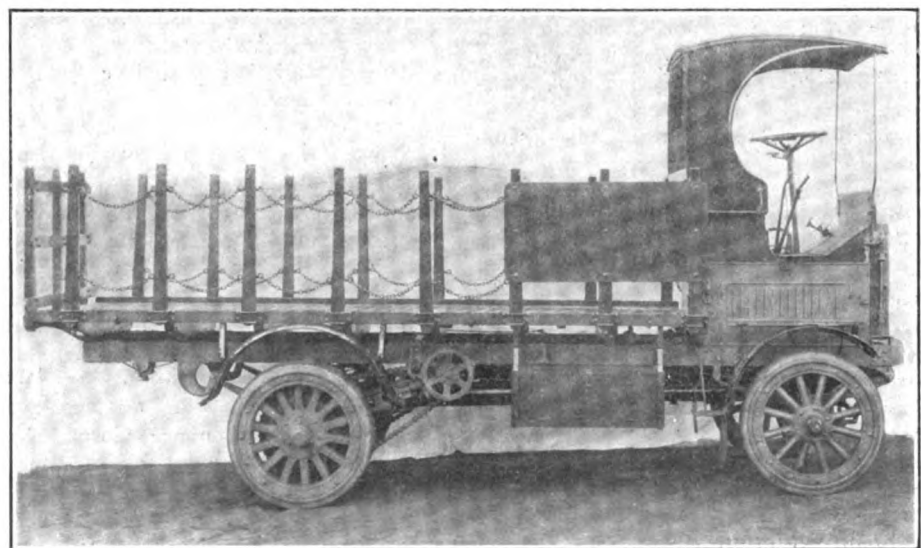
Wyckoff, Church & Partridge, Inc., New York City—One four-cylinder Commer vehicle.



NEW GRABOWSKY MODEL RATED AT FIVE TONS CAPACITY



ADAMS DELIVERY WAGON WITH COVERED EXPRESS BODY



POPE-HARTFORD THREE-TON STAKE BODY TRUCK

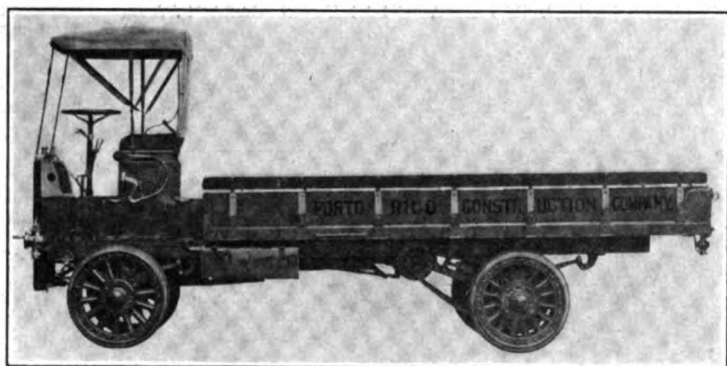
Electric Commercial Vehicles.

Anderson Electric Car Co., Detroit, Mich.—Two Detroit vehicles and one chassis.
 Baker Motor Vehicle Co., Cleveland, O.—One Baker Vehicle and one chassis.
 General Vehicle Co., Long Island City, N. Y.—One General Vehicle and one chassis.
 Lansden Co., Newark, N. J.—Two Lansden vehicles.
 M. & P. Electric Vehicle Co., Detroit, Mich.—One M. & P. vehicle.*
 Walker Vehicle Co., Chicago, Ill.—Two Walker vehicles and two chassis.
 Waverley Co., Indianapolis, Ind.—Three Waverley vehicles and one chassis.

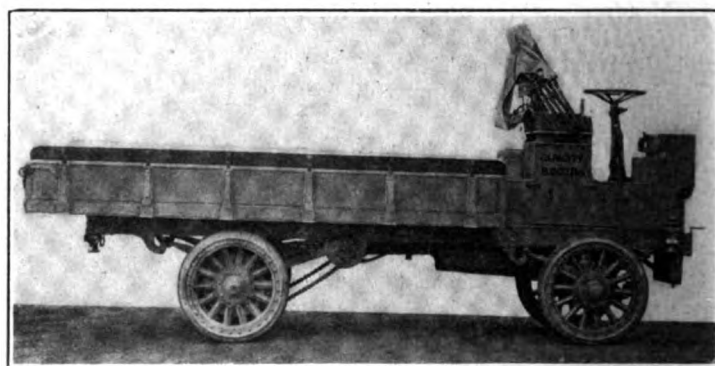
Motorcycles.

Aurora Automatic Machinery Co., Aurora, Ill.—Thor.
 Consolidated Manufacturing Co., Toledo, Ohio—Yale.
 Emblem Manufacturing Co., Angola, N. Y.—Emblem.
 Excelsior Supply Co., Chicago, Ill.—Excelsior.
 Flanders Manufacturing Co., Pontiac, Mich.—Flanders.
 Harley-Davidson Motor Co., Milwaukee, Wis.—Harley-Davidson.
 Hendee Manufacturing Co., Springfield, Mass.—Indian.
 Henderson Motorcycle Co., Detroit, Mich.—Henderson.

Iver Johnson Cycle and Arms Co., Fitchburg, Mass.—Iver Johnson.
 Miami Cycle & Mfg. Co., Middletown, Ohio—Merkel.
 Minneapolis Motorcycle Co., Minneapolis, Minn.—Minneapolis.
 New Era Auto-Cycle Co., Dayton, Ohio—New Era.
 Pierce Cycle Co., Buffalo, N. Y.—Pierce.
 Pope Manufacturing Co., Hartford, Conn.—Pope.
 Reading-Standard Co., Reading, Pa.—Reading-Standard.
 Wagner Motorcycle Co., St. Paul, Minn.—Wagner.*



SIX-TON SPEEDWELL TRUCK LISTING AT \$4,500



THE FOUR-TON SPEEDWELL WITH OPEN EXPRESS BODY

Summary of the 124 Accessory Exhibitors and What They Displayed

Exhibitors marked with an asterisk (*) did not exhibit at New York shows.

American Ball Bearing Co., Cleveland, Ohio—Ball bearings and axles.
 American Bronze Co., Berwyn, Pa.—Bronze castings.
 Apple Electric Co., Dayton, Ohio—Apco ignition and lighting system.
 Aristos Co., The, New York City—Mondex shock absorbers and Disco engine starters.
 Atlas Chain Co., Brooklyn, N. Y.—Atlas tire chains.
 Atwater Kent Mfg. Works, Philadelphia, Pa.—Uni-sparker and Monoplex horn.
 Automobile Journal Publishing Co., Pawtucket, R. I.—Publications.
 Auto Parts Mfg. Co., Muncie, Ind.—Transmissions and steering gears.
 Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains, and Brown steering gears.
 Bosch Magneto Co., New York City—Bosch magnetos.
 Briscoe Mfg. Co., Detroit, Mich.—Radiators, fenders, hoods and fittings.
 Brown-Lipe Gear Co., Syracuse, N. Y.—Transmissions, differentials and steering gears.
 Buda Co., The, Harvey, Ill.—Motors, gears, forgings and jacks.
 Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.
 Champion Ignition Co., Flint, Mich.—A-C spark plugs, coils, timers, etc.

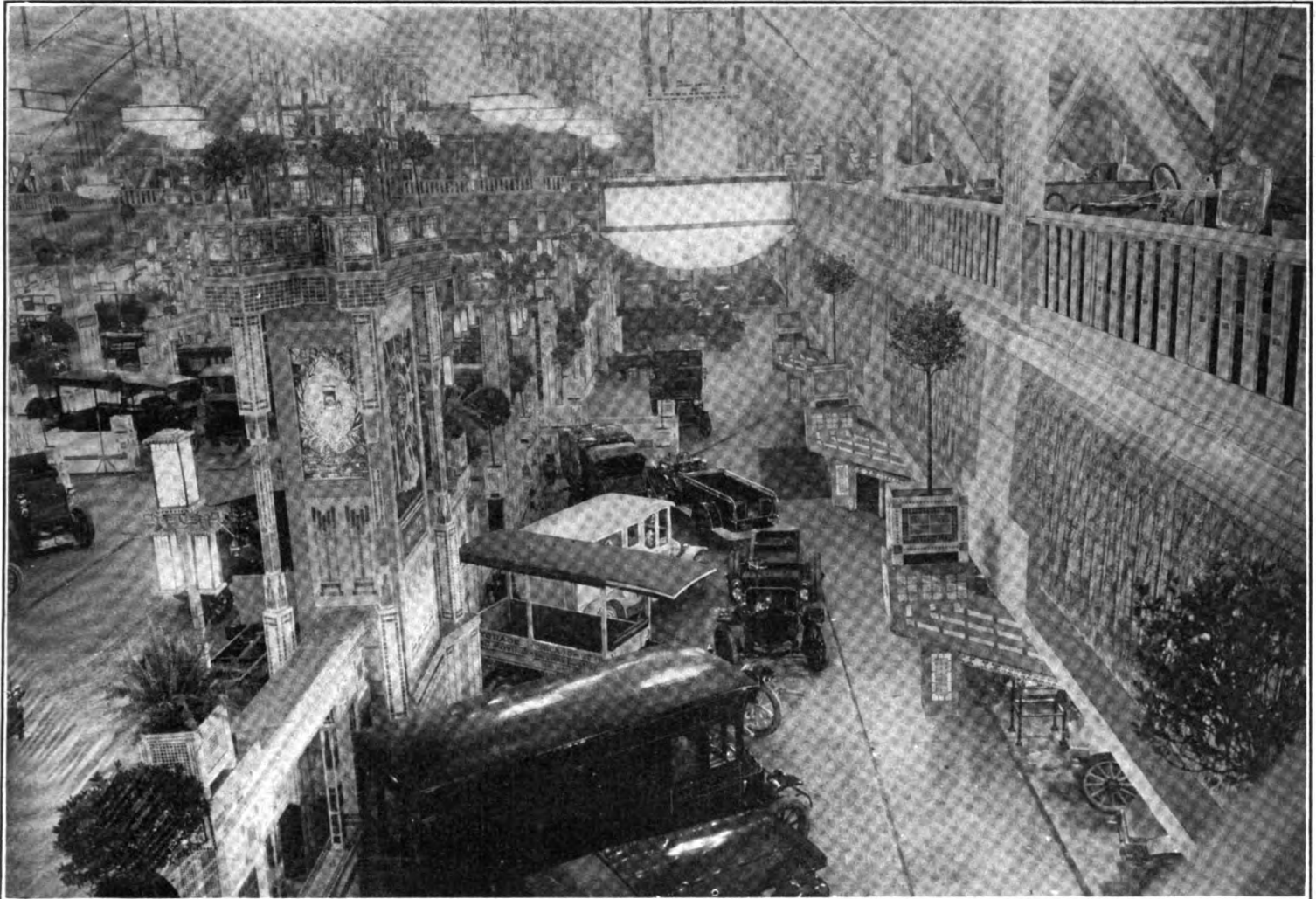
Class Journal Co., New York City—Publications.
 Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, spark coils, magnetos and other ignition specialties.
 Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.
 Continental Motor Mfg. Co., Muskegon, Mich.—Continental motors.*
 Continental Rubber Works Co., Erie, Pa.—Inner tubes, patches, etc.
 Cotta Transmission Co., Rockford, Ill.—Transmissions.*
 Cramp & Sons Ship and E. B. Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.
 Dean Electric Co., Elyria, O.—Tuto horns and Dynalux lighting systems.
 Detroit Lubricator Co., Detroit, Mich.—Lubricators.
 Diamond Chain & Mfg. Co., Indianapolis, Ind.—Chains and sprockets.
 Diamond Rubber Co., Akron, O.—Diamond tires.
 Driggs-Seabury Ordnance Corp., Sharon, Pa.—Frames, transmissions, crank shafts, etc.
 Edison Storage Battery Co., Orange, N. J.—Storage batteries.
 Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Eisemann Magneto Co., New York City—Eisemann magnetos.
 Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.
 Empire Tire Co., Trenton, N. J.—Empire tires; inner tubes, etc.
 Esterline Co., Lafayette, Ind.—Matchless electric lighting and ignition system.
 Falls Machine Co., Sheboygan Falls, Wis.—Falls motors.*
 Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.
 Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.
 Firestone Tire & Rubber Co., Akron, O.—Firestone tires and rims.
 Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires and rims.
 Garage Equipment Mfg. Co., Milwaukee, Wis.—Gem spark plug wrench and supplies.
 Gemmer Mfg. Co., Detroit, Mich.—Steering gears and parts.
 General Electric Co., Schenectady, N. Y.—Charging sets and lighting switches.
 Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
 Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.
 Gray & Davis, Amesbury, Mass.—Lamps and electric lighting system.
 Ham Mfg. Co., C. T., Rochester, N. Y.—Lamps.*

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, engine starters and jacks.
 Havoline Oil Co., New York City—Lubricants.
 Hayes Wheel Co., Jackson, Mich.—Wood wheels.*
 Herz & Co., New York City—Herz magnetos.
 Hoffnung & Co., Ltd., S., New York City—Coventry chains and lock washers.
 Horseless Age Co., New York City—Publications.

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads.
 Lee Tire & Rubber Co., Conshohocken, Pa.—Jelco-Atlas puncture-proof tires and tubes.
 Lefever Arms Co., Syracuse, N. Y.—Transmissions.
 Leland & Co., W. H., Worcester, Mass.—Machinery.*
 Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns, Conover bumpers and Raiswell jacks.

Motor, New York City—Publications.
 Muncie Gear Works, Muncie, Ind.—Wheels, gears, etc.
 National Carbon Co., Cleveland, O.—Dry cells.
 National Coil Co., Lansing, Mich.—Spark coils.
 National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
 New York & New Jersey Lubricants Co., New York City—Columbia lubricants.
 Norton Grinding Co., Worcester, Mass.—Abrasive materials.*



LOOKING DOWN ONE OF THE SIDE AISLES IN THE CHICAGO COLISEUM

Hydraulic Oil Storage Co., Detroit, Mich.—Hydraulic fuel storage system.
 Imperial Brass Mfg. Co., Chicago, Ill.—Carburettors, lubricators, manifolds, tire pumps, valves and cocks.
 Johnson & Co., Isaac G., Spuyten Duyvil, N. Y.—Forgings and castings.
 Jones Speedometer, New Rochelle, N. Y.—Jones speedometers, odometers and recorders.
 Kinsey Mfg. Co., Toledo, Ohio—Frames, radiators, fans, tanks, windshields and other fittings.*
 Kokomo Electric Co., Kokomo, Ind.—Kingston coils and timers.
 Lavigne Mfg. Co., Detroit, Mich.—Steering gears and lubricators.

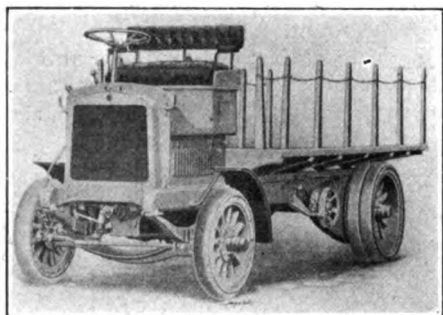
McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and gaskets.
 Marburg Bros. Inc., New York City—Mea magnetos.
 Marshall Oil Co., Marshalltown, Ia.—Lubricants.*
 Merchant & Evans Co., Philadelphia, Pa.—Hele Shaw clutches and gear-change mechanisms.
 Michelin Tire Co., Milltown, N. J.—Michelin tires.*
 Michigan Magneto Co., Detroit, Mich.—Michigan magnetos.*
 Milwaukee Oil Pump and Tank Co., Milwaukee, Wis.—Fuel storage apparatus.*
 Mosler & Co., A. R., New York City—Spit-Fire spark plugs.

Oliver Mfg. Co., Chicago, Ill.—Peerless jacks.
 Pennsylvania Rubber Co., Jeanette, Pa.—Pennsylvania and Polack tires.
 Perfection Spring Co., Cleveland, O.—Perfection automobile springs.
 Pittsfield Spark Coil Co., Dalton, Mass.—Pittsfield magnetos, Jewel plugs and other ignition devices.
 Pyrene Co. of Illinois, Chicago, Ill.—Fire extinguishers.*
 Power Wagon Publishing Co., Chicago, Ill.—Publications.
 Remy Electric Co., Anderson, Ind.—Remy magnetos and electric lighting systems.
 Republic Rubber Co., Youngstown, O.—Republic tires.

Rhineland Machine Works, New York City
—Ball bearings.

Ross Gear & Tool Co., Lafayette, Ind.—
Steering gears.

Royal Equipment Co., Bridgeport, Conn.—
Band brakes, Raybestos brake lining
materials and Gyrex gasoline mixer.



THE FIVE-TON LOZIER

Spacke Machine Co., F. W., Indianapolis,
Ind.—Gears, piston rings, motorcycle
engines.

Spicer Mfg. Co., Plainfield, N. J.—Spicer
universal joints.

Splitdorf, C. F., New York City—Splitdorf
magnetos and spark plugs.

Standard Roller Bearing Co., Philadelphia,
Pa.—Standard ball and roller bearings.

Standard Welding Co., Cleveland, O.—
Electrically welded rims, tubing and
parts.

Sewell Cushion Wheel Co., Detroit, Mich.
—Spring wheels.

Sheldon Axle Co., Wilkes-Barre, Pa.—
Axles and springs.

S & K Tire Co., Chicago, Ill.—*

Stewart & Clark Mfg. Co., Chicago, Ill.—
Stewart speedometers.



ENCLOSED PANEL BODY ON PACKERS TWO-TON CHASSIS

Stromberg Motor Devices Co., Chicago, Ill.
—Stromberg carburettors.

Stutz Auto Parts Co., Indianapolis, Ind.—
Parts.

Swinehart Tire & Rubber Co., Akron, O.—
Swinehart tires.

Texas Co., New York City.—Lubricants.

Timken Detroit Axle Co., Detroit, Mich.—
Axles.

United Rim Co., Akron, O.—Standard Uni-
versal rims.

United States Ball Bearing Co., Oak Park,
Ill.—Ball bearings.*

United States Light and Heat Co., New
York City—Storage batteries.

United States Tire Co., New York City—
Hartford, G & J, Morgan & Wright,
Continental and United States tires.

Van Cleef Bros., Chicago, Ill.—*

Veeder Mfg. Co., Hartford, Conn.—Veeder
tachometers and odometers.

Vesta Accumulator Co., Chicago, Ill.—
Vesta lamps, generators and accumula-
tors.

Warner Gear Co., Muncie, Ind.—Transmis-
sions, steering gears, levers, etc.

Warner Instrument Co., Beloit, Wis.—
Warner autometers.

Warner Mfg. Co., Toledo, O.—Transmis-
sions, unit power plants, and steering
gears.

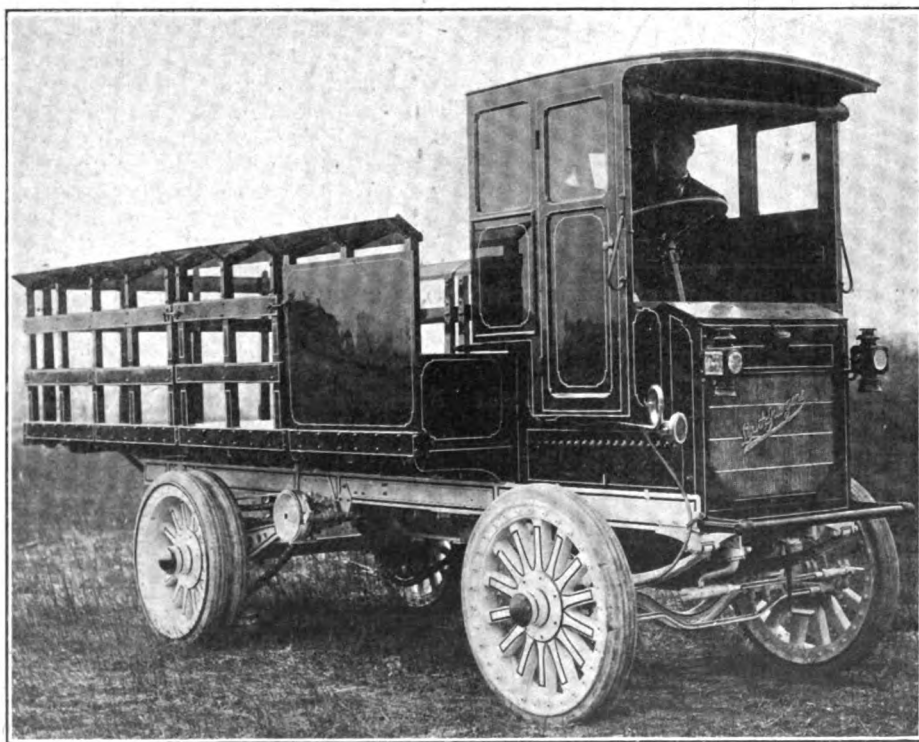
Waukesha Motor Co., Waukesha, Wis.—
Motors.*

Wayne Oil Tank and Pump Co., Ft.
Wayne, Ind.—Oil storage apparatus.

Weed Chain Tire Grip Co., New York City
—Weed tire chains.

Western Motor Co., Marion, Ind.—Ruten-
ber motors.*

Weston-Mott Co., Flint, Mich.—Transmis-
sions and axles.



THREE-TON LAUTH-JUERGENS WITH ENCLOSED CAB



MERCURY FULLY ENCLOSED WAGON

Wheeler & Schebler Co., Indianapolis, Ind.
—Schebler carburettors and magnetos.

Whitney Mfg. Co., Hartford, Conn.—Whit-
ney chains.

Williams & Co., J. H., Brooklyn, N. Y.—
Forgings and tools.

Wisconsin Motor Mfg. Co., Milwaukee,
Wis.—Motors.*

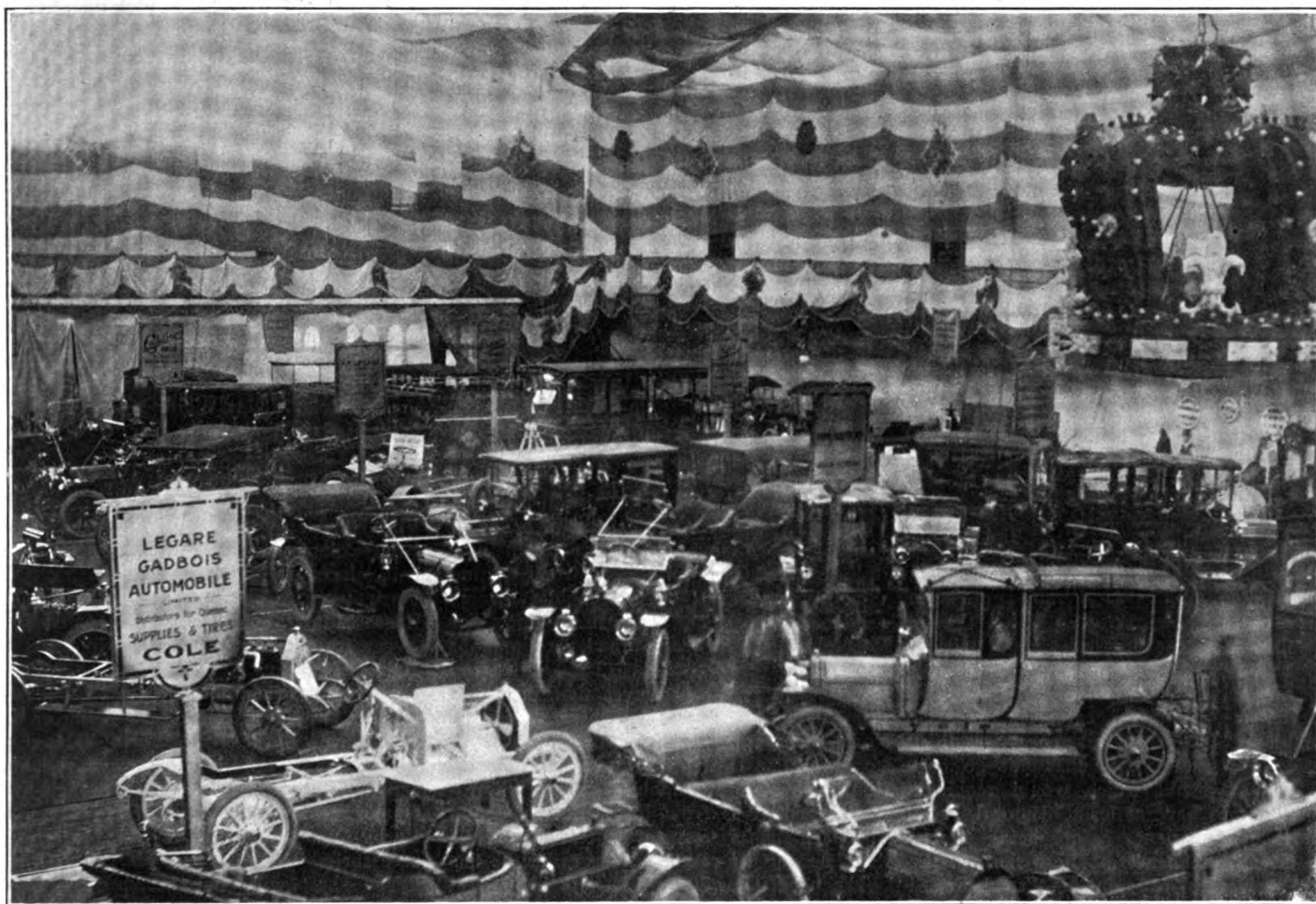
MONTREAL'S SHOW CROWNS ITSELF

Dominated by American Cars, But Electric Crown and Canadian Soldierly Contribute Picturesqueness.

It was rather difficult for the visitor entering the Montreal Drill Hall on Saturday evening last, the 3rd inst., to discover whether he were attending the sixth annual show of the Automobile Club of Canada, or some fascinating military fete, which in some unknown manner had been substituted for the scheduled event. This

warm enough to dissipate thoughts of the deep snow outside. Facing the main entrance, in plain sight of all who enter, is a massive crown, composed entirely of incandescent lights supported on a wooden subframe. The vari-colored lights which adorn this handsome decorative piece, together with an equal number which are clustered so as to form a Union Jack over the center of the drill hall, add sufficient color for even the most critical observer. The remainder of the decorations, consist of streamers of white incandescents running the entire length of the hall, and arc and tungsten lights so disposed as to throw their rays to the best of advantage.

car Co., McLaughlin, Fiat and Rauch & Lang electrics; Comet Motor Co., Chalmers and Packard; Automobile Francaise, Limited, Berliet and Gregoire; Motor Import Co., Franklin, Hupmobile, Hudson, Brush; A. Jennings & Co., Gramm trucks; Pope-Hartford Co. of Canada, Pope-Hartford; Baker Electric Co., Baker electric, Detroit electric cars; Hamilton Machinery Co., Inter-State; Rosseau Bros., Cadillac and Kelly trucks; Reo Motor Car Co. of Canada, Reo; Montreal Locomotive Works, Alco pleasure cars and truck; E-M-F Mfg. Co., E-M-F; Legare-Gadbois, Cole; Gareau Motor Co., Everitt, Amplex and Kissell; Ramsay Motor Co., Schacht; Clark-



GENERAL VIEW OF MONTREAL EXHIBITION, SHOWING DECORATIONS AND "KING GEORGE'S CROWN"

military impression is caused by the presence of numerous members of the Royal Dragoons, who in full uniform are policing the drill hall, and is heightened when the balcony is reached by the display of several squads of militia who go through drill maneuvers for the entertainment of the prospective automobile purchaser. Indeed, it is not until in the far end of the balcony and considerably removed from the soldiery that one of Boston's "suffragette" orchestras attracts attention and dispels the illusion.

The decorations are eye-tickling and

Eight brands of Canadian-made or Canadian-assembled cars are in evidence, but American vehicles dominate the show. There are 34 brands of them displayed, while there are four French makes—and none of English manufacture. They are displayed by 27 exhibitors. There are but 14 accessory exhibitors, eight of whom show tires. The show will progress until Saturday next, the 10th of February.

Among the exhibitors and the cars displayed are: Robert & Robert, Jackson; Ford Motor Co. of Canada, Ford; Russell Motor Car Co., Russell; McLaughlin Motor

Carter Automobile Co., Cutting; Levesque's Agency, Abbott-Detroit; J. A. Michaud, Vinot; Regal Auto Co., Regal cars; Royal Auto Co., Stevens-Duryea, Renault, Krit; J. I. Case Co., Case; and W. E. Baker, King.

Accessories: Goodyear Tire & Rubber Goods Co.; Canadian Consolidated Rubber Co.; John Millen & Son; Gaulois Tire Agency of Canada; National Carbox Co.; S. F. Bowser & Co.; Dunlop Rubber Co.; Bosch Magneto Co.; Rubber Tire Wheel Agency; Independent Tire Co.; Imperial Oil Co.; Mussens, Limited.

FLOOD OF BILLS IN MASSACHUSETTS

Legislature Overwhelmed with Automobile Measures—Even the Good Old 30-Miles Gear Bill Reappears.

The three "signal" bills and the "truck capacity limit" bill, which were reported in last week's Motor World as having been introduced into the Massachusetts legislature, are but a few of the bills affecting the motorist with which the solons of the Bay State have been deluged. Some of the proposed measures are good, some are bad and the majority are indifferent, and according to present indications there is little likelihood of their becoming laws.

Among the multitude of bills is one which has been introduced by the National Automobile Association eliminating the eight-mile-an-hour clause when a car is being driven around a corner, substituting therefor the provision that motorists must slow down, or even stop, when conditions demand it. Higher penalties for violations of the motor laws are provided in another bill; the author of which would have offenders pay \$25 the first time, \$50 the second and \$100 the third time, giving the judge permission, however, to impose the \$100 fine for the first offense, should he feel so inclined.

Another bill extends the imprisonment clause from ten days to one year and calls for a revocation of the license after two convictions in one year, while a fourth bill would boost the fine up to \$1,000 and one year's imprisonment where a person figures in an accident and some one is injured. Where a person is killed the bill would place the fine at \$3,000 and the imprisonment at three years.

Still another hardy perennial would limit the gear ratio of cars, so that they could not be operated at more than thirty miles an hour; but it does not go quite as far as a bill which would require a chauffeur to have at least 18 months' shop and road experience before being allowed to procure a license. Where the prospective driver is to gain his "road experience" without a license is not explained. Then there is a measure which would hold the owner of the car criminally and civilly responsible for any accident that might happen, provided he is in the car at the time of the accident, while another bill would have it considered prima facie evidence of the owner's or his servant's presence in the car, if it is proven that a car bearing his registration number caused the accident. One lawmaker would have every owner of a car file a bond of \$500 with the Highway Commission as security for any judgment which might be obtained against him for injuries, making the highway commission a kind of 'clearing house' for accidents.

Still another would have the Highways Commission furnish to the Police Departments of every city and town the name and residence of the owner, the horsepower, make, registration number, etc., of every car registered in the State; while examination for physical defects of would-be drivers would be added to the duties of the much-overworked Highways Commission by a bill introduced by a member from Boston itself.

Sightseeing vehicles will cost their owners a bond of \$5,000 for each passenger carried, if a bill, which was killed last year but has been introduced again, goes through; there is a bill that seeks to wipe out the section of the Massachusetts law relative to giving information in case of accident; a bill that would allow officers of the law to use motor cars when serving civil processes; a bill that would compel a man who sells his car during the summer, to make application for a refund of part of the registration fee, before September 1, on penalty of losing the whole fee, if applied for later, and other bills which still are buried in the avalanche of bills introduced, but which undoubtedly will come up for discussion before the session is much further advanced.

Accident Insurance Illegal in Missouri.

In Missouri the State Insurance Superintendent, whose name is Blake, has made it a near-crime for automobile owners to protect themselves against the result of accidents in which they may be so unfortunate as to become involved. This remarkable action took the form of an order issued by the insurance superintendent prohibiting casualty companies from writing liability insurance for automobile owners indemnifying them against liability for damages arising from injuries to persons struck by automobiles. The high and mighty Mr. Blake believes that insurance of this nature causes carelessness on the part of automobilists, and that the way to prevent such carelessness is to render it impossible for automobile owners to protect themselves from loss. Blake's action aroused such a storm of protest that, while he has not yet rescinded the order, he has suspended it for 30 days.

Injured Employee Secures \$34,000 Award.

What is said to be the largest award ever made in a Philadelphia Common Plea Court, was rendered to Frank Force, by a jury in his damage suit against the Quaker City Automobile Co. According to the testimony Force's back was broken by the fall of an elevator in the automobile company's establishment at Broad and Race streets on May 20, 1907. The spinal cord was severed, paralysis below the waist ensuing, from which, according to the physicians' testimony, he would never recover. The jury was so impressed with the plaintiff's plight, that it awarded him the sum of \$34,000.

ST. LOUIS SHOW IN JAPANESE GARDEN

Seventeen Exhibitors Show 125 Machines—Many Notable Absentees—Only Four Accessory Displays.

Amid the foliage of a modern Japanese garden, into which the Coliseum has been transformed for the occasion, the St. Louis automobile show opened Monday last, 5th inst., under the pilotage of the Coliseum management. This exhibition, however, is as notable for its absentees as for those that are present. Despite the fact that but 17 motor vehicle exhibitors are represented, 125 machines, fitted for all classes of service, from field plowing, general delivery and fire fighting to providing a quick and comfortable means of locomotion, are on hand, among which are two—the Midland, displayed at the stand of the Lewis Sales Co., and the Kimball electric, shown by C. P. Kimball Co., of Chicago—which have not been seen at any of the previous shows this season.

Among the exhibitors are Weber Drayage and Warehouse Co., Studebaker, E-M-F and Flanders; M. W. Bond Automobile Co., Warren; Lewis Sales Co., Midland; Wiemeyer Motor Co., Apperson; Charles F. Schwartz, Velie; White Motor Car Co., White; Franklin Motor Car Co., White; Franklin Motor Car Co., Franklin; Kingman-St. Louis Implement Co., Rambler; Kissel Kar Co., Kissel; Haynes Automobile Co., Haynes; Columbus Buggy Co., Firestone-Columbus; C. P. Kimball Co., Kimball electric; Mack Motor Truck Co., Mack truck; Cochrane Motor Sales Co., Chase Motor Truck Co., Chase; Avery Co., Avery tractor; Anderson Electric Car Co., Detroit electric.

The crop of automobile accessories exhibitors is meager indeed, consisting of but three dealers, the Auto Parts Sales Co., with a line of sundries; American Welding and Auto Repair Co., who show their system of welding, and the Hurck Motor and Cycle Co., with a display of motorcycle accessories.

The show will continue until Saturday night next, 10th inst.

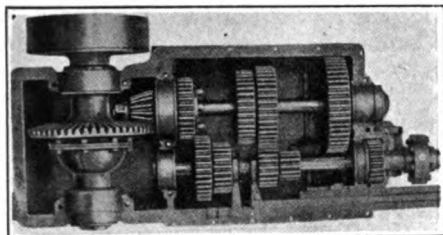
Washington Show is Abandoned.

The local show which was to have been inaugurated on Thursday last, 1st inst., to continue for one week, under the auspices of the Washington (D. C.) dealers, did not take place. The show committee, contrary to expectations, found it impossible to retain Convention Hall for the dates specified, nor for any other suitable dates during February, and the affair therefore was abandoned. It is barely possible that a show will be held during March, although most of the dealers consider March too late in the season to produce the best sales results.

TRUCK PROBLEMS; THE CHANGE SPEED MECHANISM

Requirements for Commercial Vehicle and Pleasure Car Work That Are Vastly Different—Sliding Gears of Present Type Often Termed "Barbarous" by Engineers; But There's Nothing Better Available—Development of the Various Types Now in Use and Opinions Concerning Them.

While the change-speed gear of the pleasure car, after passing through progressive stages of experiment and development, has arrived at a point where it partakes of the standardization that marks the dominant type of pleasure car of the day, the change-speed gear of the commercial vehicle still is in the transitory state, to some extent—a condition similar to that through which the pleasure car passed some time ago. This is clearly indicated by the fact that while approximately 95 per cent. of all American pleasure cars are equipped with selective sliding gears, only about 65 per cent. of the commercial machines have gears of this type, while some 35 per cent. have various forms of planetary friction, individual clutch and hydraulic transmissions, the planetary type predominating in the non-sliding class and the others following in the order named. There are two

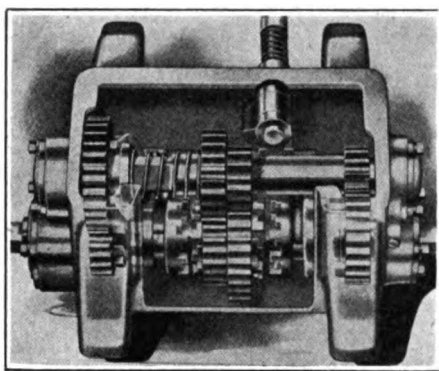


SAURER FOUR SPEED SELECTIVE

cardinal reasons for this difference of opinion on the part of motor truck and wagon manufacturers on this point. In the first place, the commercial vehicle came into existence as a practicality, long after the pleasure car, was handicapped by its late start, and even after it was "launched" it did not receive the attention that was lavished on the more spectacular pleasure car. And in the second place, obstacles that lurk in the path of the commercial vehicle engineer are more serious, as well as more numerous, than those encountered by pleasure car designers, and, moreover, there is a smaller fund of information and experience to draw upon.

In principle the dominant sliding gear is not all that could be desired as a means for obtaining different speed ratios between the motor and the rear wheels. The idea of sliding into mesh two gears which, before meshing, rotated at different speeds, does not seem to be exactly a refined mechanical proceeding; in fact, engineers frequently have called the principle "barbarous." Nevertheless nothing has been developed that is as good, if the fact that a large majority of cars of all kinds and in

all countries employ sliding gears is any criterion. It is an instance of the triumph of engineering skill over natural difficulties, for it is by sheer force of refinement of design and perfection of material and workmanship that this rough-and-ready method has been made practical and really satisfactory. The "selective" control of sliding gears has followed closely upon the heels of the development of the gearing



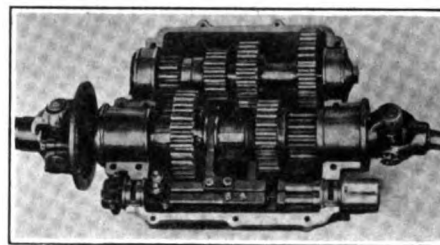
THE COTTA CHANGE GEAR

itself, and though a few years ago engineers differed considerably as to the merits of the two control systems—"selective" versus "progressive"—the selective type now has things practically its own way. The great advantage of the selective control is that any desired speed can be picked up at once, and it is possible to drop back clear from top speed to reverse, without passing through intermediate speeds; while with the progressive type of control it is necessary, as the designation indicates, to pass successively through any gears that may intervene between the gear in use and that to which it is desired to change.

Three speeds forward and the universal single reverse speed are employed in by far the greatest number of sliding gearsets, though a fourth forward speed is sometimes added. In this case the highest speed frequently is an "overstep"—that is, the direct drive is on third speed, the propeller shaft or tail-shaft, rotating at the same speed as the crankshaft of the motor, while the fourth speed or "overstep" is through gearing and causes the propeller shaft, or the shaft carrying the pinion which drives the countershaft, as the case may be, to rotate faster than the motor shaft. This gives an extra high speed for use under favorable conditions, where the machine can be driven without much power, and has the advantage that it permits the motor to run at a slow speed,

thereby reducing wear and tear on the moving parts. The third speed is direct because it is intended to be the one most used in ordinary work, and the final reduction, whether through sprockets and chains, bevel gears or worm gearing, is so calculated as to give a speed that is best suited to the general run of conditions. The Gramm truck is a prominent example of a heavy machine using a four-speed gear with direct drive on third and an overstep fourth.

"We consider the very simplest form of sliding gear transmission to be the best thing obtainable," says the Gramm company. "The transmission must have four speeds, it must be selective, and the gears must be made of the best steel obtainable, treated in the best manner possible." With reference to the fourth or overstep speed,



PIERCE-ARROW THREE SPEED GEAR

the Gramm company says: "We have been very much surprised to find this fourth speed used on about three-fourths of the service of the trucks. The fourth speed has stood up admirably and there has been no complaint regarding lack of power." While this speaks well for the power developed by the motor at low speed, it indicates that the truck is probably being driven at high speed under load, which is not conducive to the welfare of the machine as a whole, as is indicated by the practice of a number of makers in equipping their cars with governors which absolutely prevent the attainment of a speed in excess of that for which the governor is set.

While it might be inferred that a gear suitable for a touring car would be capable of giving satisfactory service in a light commercial machine, such does not seem to be the case, in most instances, for the reason that the wear and tear on the gears of a commercial car is many times that of the gears in a pleasure car, and, moreover, the pleasure car is usually driven in a manner entirely different from the way a truck or delivery wagon is put through its paces. The makers of the Federal truck feel quite strongly on this point. "There

has been trouble in the truck industry because of transmissions not standing up" they state, "and it is because makers have tried to adopt light pleasure car transmissions for truck service, and it will not do. We believe the three-speed sliding gear is correct for trucks, as this type of transmission has been worked out quite thoroughly."

In order to stand the downright hard work of commercial service, the gear faces must be large and the bearing surfaces of the shafts ample, so as to give the necessary wearing surfaces, and the margin of safety is made very large.

The situation with regard to the planetary gear, which, though a long way behind the sliding gear in point of numbers, is next to it in importance, is somewhat curious. It might be supposed that the planetary gear would be confined to the smallest and lightest machines, but such is not the case, for while it is used in a great many small wagons, its most striking employment is in the huge ten-ton Hewitt trucks, which are regularly fitted with two-speed planetary gears. Edward R. Hewitt, designer of these ponderous machines, has confidence in the two-speed planetary system for the heaviest work under ordinary city conditions, but is by no means blind to the advantages of additional speeds for use in hilly districts.

"In service in large cities it is necessary to stop and start the loads with great frequency, and it is very difficult to get clutches that will do this work properly," says Hewitt. "The planetary box, as we have it constructed, furnishes an ideal clutch for this service. It is impossible for the driver to injure the gears in any way, and the control is simpler with pedals than with hand levers and allows the driver on a heavy truck to always have both hands on the steering wheel. . . . The maintenance on these boxes in the large number of trucks we have out is almost nothing. We never have any broken gears and rarely have any trouble. . . . except when lubrication is forgotten."

Owing to its having but two speeds, the planetary transmission is at a disadvantage in a hilly country, and for this class of service a number of Hewitt trucks have been built with three-speed sliding gears which have given very satisfactory results; but, according to Hewitt, the difficulties are transferred to the clutch, which must be designed with the greatest care. It must be of ample dimensions, not only to transmit the full power of the motor, but also to withstand the excessive wear and tear of frequent starts and the kind of treatment accorded by drivers who are frequently none too skilful and have no particular objection to getting the car under way with a series of wrenching jerks. The stresses imposed upon the clutch, gears and the entire power-transmission system when bringing a heavy load on a heavy truck into motion from a state of rest are something

enormous, and the weakest part of the system will of course feel the strain first and give the most trouble.

It is in the light class, however, that the planetary gear is in its glory, for in machines carrying a ton and a half and under one third have planetary gears, fifty per cent. have sliding gears and friction drive does the work in the balance. It seems reasonable to conclude that if the planetary and friction drives will give satisfactory service in heavy machines they will be suitable for the "small fry," and this is the case, for as a matter of fact all these systems give excellent results for light loads when properly designed and constructed of suitable materials.

While the individual clutch system is a direct development of the sliding gear, it is different in the very important respect that the gears do not slide at all, but are constantly in mesh, running idle on their shafts when not transmitting power. Toothed or "dog" clutches, internal gear clutches and multiple disk clutches are employed to lock the gears to their shafts. The advantage of this system is that while there is naturally a little wear on the idling gears, it is so slight as to be negligible in practice, and the clutches are subjected to wear only at the moment of engagement. Though there are not a great many makers employing individual clutch gearsets, those who do so make up in importance what they lack in numbers. The Walter truck company has just adopted for its trucks the Westinghouse individual clutch system, in which there are three multiple disk clutches for the three forward speeds, no separate clutch being required.

Another well known machine in which the individual clutch system with gears always in mesh and selective control is used is the Morgan, whose designer, R. L. Morgan, has had experience with various types of gears and has finally settled on this gear, with three speeds and "dog" clutches, as best suited, in his opinion, for the work. Incidentally, Morgan has some very decided views on the subject of change-speed transmissions on the market," he says, "but the man who puts in a cheap one is making a very grave mistake."

The Commer truck gear is a striking example of the development of the individual clutch gear system, for the clutches, which are of the "dog" type, are under the control of a governor, and though the driver of the car may set his lever for any speed he pleases, that speed will not become engaged unless there is a proper relation between the speed of the motor and that of the car. If there is too great a difference, so that there would be danger of stalling the motor on the one hand, or of racing it on the other, the gear simply declines to "take hold" and the driver either changes the position of his lever or else changes the speed of his engine. The system works with beautiful smoothness and has with-

stood some extremely severe tests with the gearbox sealed so that repairs or adjustments could not be made during the test period. The Cotta gear, used in the Eclipse truck and other machines, embodies an individual clutch mechanism with dog clutches of very practical design.

The friction drive is the result of an attempt to materialize an ideal—and it must be said that the attempt has met with no small measure of success. A disk on the driving shaft rotating at engine speed, and a second disk, at right angles, with its edge in contact with the face of the driving disk and capable of being moved so as to make contact with any part of the driving disk, from center to circumference—these are the chief components of a system which eliminates all shifting gears and clutches, and operates in absolute silence. The disks separated, the rear wheels are not driven; the driven disk running near the edge of the driving disk—high speed; near the center—low speed; across the center—reverse. There are no gears, no shifting mechanism and no gearbox, and no clutch. It is only natural that a vast amount of thought and labor should have been devoted to the development of a system promising so much, and though there are those who scoff at it, there is no doubt whatever that the smooth-running disks are efficient—in fact, when properly made and in good condition a friction transmission will hold until the motor stalls, which is about all that any system can do. While the friction system of transmitting power naturally finds its widest field of usefulness in cars of comparatively small carrying capacity, it is by no means confined to light work, for it is found in at least three makes of trucks carrying up to three tons—the Lambert, Seitz and Utility. The frictional surfaces are usually of cast iron and compressed paper—the driving disk faced with cast iron and the driven disk edged with the paper composition, both of which can be replaced easily and cheaply when worn. As the simplest form of friction drive includes a cross-shaft upon which the driven disk slides, and as this naturally falls in the proper position for the purpose, it commonly is fitted with sprockets and the rear wheels driven by side chains. This is by far the commonest final drive employed in friction drive machines, though there are a few of the smaller cars in which drive is through a single chain to a live rear axle, and at least one case where a shaft drive is used.

Only one American truck embodies a hydraulic transmission—the Remington, in which the Manly drive is incorporated. The Remingtons are all heavy trucks, ranging from 5 tons to 10 tons capacity. Briefly, the Manly drive consists of a series of engine driven pumps which circulate oil, and a hydraulic motor, set in motion by the oil driven by the pump, the hydraulic motor driving a countershaft which mounts sprockets carrying the chains which constitute the final driving means. The most in-

genious part of the Manly system is the governing mechanism. This consists of an eccentrically-operating regulator by means of which the stroke of the pumps can be made longer or shorter by the movement of a single lever. When the stroke is short the speed of the vehicle is reduced, but as the same power is exerted during a shorter plunger travel, there is a greater leverage upon the hydraulic motor, and the effect is that of a low gear. A single lever changes the speed, which may be anything desired, there being no such limitations as are set by gears, and the same lever, moved over the center, reverses the direction of the hydraulic motor. The drive is absolutely rigid, owing to the non-compressibility of oil, and the drive is as positive as a gear drive.

There is still another form of power transmission which, like the friction and hydraulic drives is unlimited as to speed ratios, but which is without the mechanical connection of the former and the rigidity of the latter. This is the electric transmission. While the necessary combination of gasoline motor, electric generator and electric motors, together with the controlling means required for all, might appear at first to be unmanageable, practice proves that the contrary is true, and the gas-electric system, as it is commonly called, is extremely easily handled. The design of a vehicle embodying this system naturally calls for the solution of several hard problems in the relative capacities of the various elements, and it is only of late years that sufficient attention has been given to the subject to bring to light its practical possibilities. Essentially, the system consists of a gasoline motor which drives a generator, the current from which is the source of energy for the electric motors which drive the wheels. The system is particularly suited to heavy work. The Couple-Gear gas-electric trucks make use of four electric motors, one enclosed within each of the wheels, which are made up with steel disks instead of spokes. The motors are of the series type, and each takes whatever current it requires, so that no differential is required and if one wheel slips the motors in the other wheels automatically take the extra current required to do the extra work. The control of the vehicle is effected through a foot-operated throttle; speeding up the motor increases the voltage and, consequently, the speed, so that any speed can be obtained by changing the throttle opening. There is a controller which groups the motors in series for very hard pulling, and also provides a reverse, in which there is the same power and the same absence of limitation as to speeds as when the controller is in forward position. There also is a field rheostat which weakens the field of the generator, so that on a heavy pull, which is not quite heavy enough, however, to require the motors to be placed in series, the magnetic "drag" on the armature is reduced and the engine allowed to speed up.

In this machine steering, as well as driving, is through all four wheels.

The term "transmission" as commonly applied to the change-speed gear of a motor car is incorrect, for the reason that the transmission really includes all the power-conveying mechanism between the motor and the rear wheels, of which the change-speed gearing is only a part, though of course a very important one. The clutch, propeller shaft, chains, jackshaft and so on are as much entitled to the term "transmission" as is the gearbox, though custom and carelessness have somehow fixed the name on the latter.

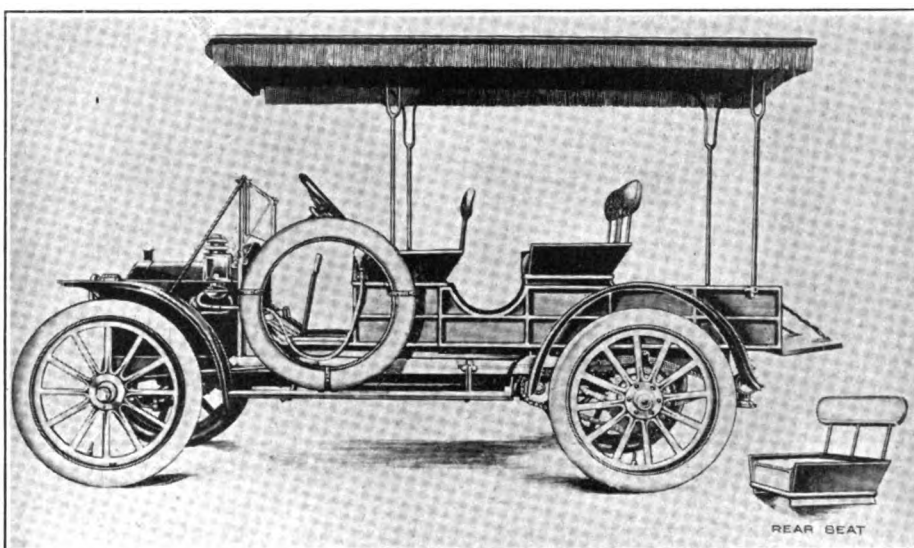
Motor Wagon as a Country Club Trap.

While it is possible to use a motor car of the conventional touring type for com-

top. By the removal of the rear seat the extra space can be used for baggage or other inanimate freight. The chassis is of the standard type of this concern, having a two-cylinder opposed two-stroke motor, rated at 16 horsepower, driving through multiple disk clutch, planetary gear and jackshaft and side chains.

Cast Iron and Effects of Lubrication.

Sometimes a little knowledge of the "why and wherefore" of things is interesting and, perhaps, useful, and may throw light on otherwise obscure matters. For instance, everyone does not know that the surface of a piece of cast iron undergoes a remarkable change under friction. The metal, naturally soft, acquires a film or "skin" of glassy hardness—a skin that is



DETROIT WAGON CONVERTED INTO A COUNTRY CLUB TRAP

bined passenger and baggage service, the appearance of such a vehicle with its tonneau piled with traveling impedimenta and the remaining space packed with the travelers themselves, does not give the impression of the right thing in the right place. Of course, two separate vehicles can be used, one for passengers and the other for baggage; but ordinarily this is not a convenient or economical arrangement, and for the use of country clubs and private country residences, where there is considerable work of this sort, an appropriate combination or convertible vehicle should be a great convenience. Such a machine is the "country club trap" brought out by the Detroit Motor Wagon Co., after the design of W. D. Grand, of the Manhattan Motor Wagon Co., which handles the Detroit vehicle in New York and who is well known as a member of the former Tichenor-Grand horse company, and whose experience has indicated the need of a convertible car of this kind. As the illustration shows, the trap really is the Detroit wagon provided with the rear seat and with a space behind the seats for the accommodation of baggage, the whole being covered by a canopy

penetrated with difficulty by a file. This is the secret of the long wear of properly lubricated cylinders and pistons, and this is one of the properties that make cast iron of such inestimable value in the mechanical arts. Lack of lubrication, however, permits the working surfaces to come into actual contact, and the film is scraped off and the surface destroyed for working purposes. This is why a cylinder "cuts" so rapidly when lubrication fails. Other metals acquire a similar glaze under friction, but none to the same extent as cast iron.

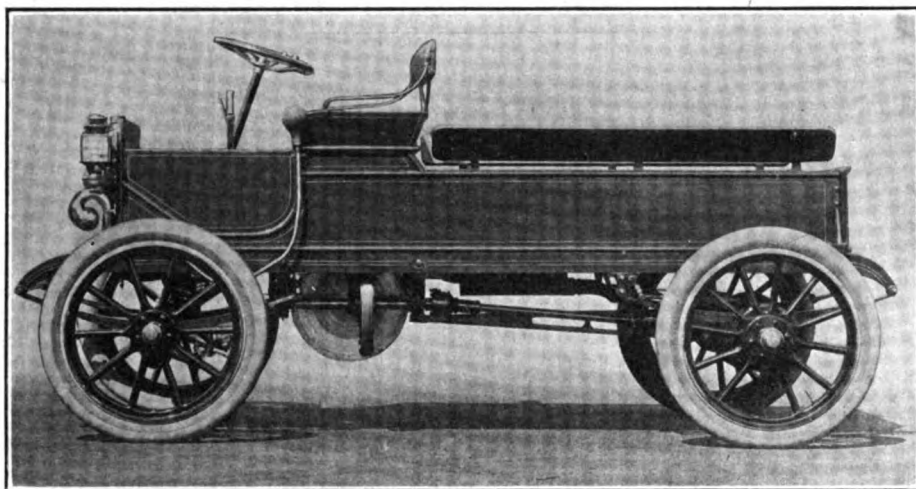
Worm Drive Dates Back to Antiquity.

Apparently no one knows just how old is the worm drive which now is attaining such prominence in this country. That it is at least several hundred years old is brought out by the Pierce-Arrow Motor Co., in remarking its use of it, states that there are drawings of that age in the British museum from the hand of Durer. These drawings show the worm drive, operated by hand, which was used to propel some of the floats used in the great pageants of bygone periods.

FRICION DRIVE FOR WOLVERINE

New Detroit Commercial Car a Model of Simplicity—The Men Who Are Behind the Product.

One of the noticeable developments in the commercial vehicle field during the past twelvemonth has been the increase in the number of cars of the lighter types that have been brought out—vehicles that are designed for loads not to exceed what a single horse can haul. Among the more recently designed light trucks and one that must command notice, is the Wolverine-Detroit, a wagon of 800 pounds capacity,



WOLVERINE-DETROIT, SHOWING FRICION DISKS AND SHAFT DRIVE

brought out under favorable auspices by Pratt, Carter, Sigsbee & Co., of Detroit, which is composed of men who know their business. W. C. Pratt, the mechanical engineer of the firm, formerly was with the Hudson Motor Car Co., the Timken-Detroit Axle Co. and the Timken Roller Bearing Co.; H. C. Carter is a practical motor car man, having had several years' experience in the garage business, and I. V. Sigsbee previously was in charge of the pattern making department of the American Motor Castings Co. and, prior to that, of the Frontier Engineering Co. H. W. Alden, engineer of the Timken-Detroit Axle Co., is the fourth member of the partnership, which was formed for the purpose of doing the experimental and development work and, it is expected, will be incorporated about March 1 next. Four demonstration cars were built, and one of these is in the service of the Timken-Detroit Axle Co.

Mechanically, the aim of the builders has been to produce a car of the greatest simplicity compatible with efficient operation, and the design certainly leaves little to be desired in the matter of lack of complexity. The motor has a single cylinder of the long stroke type, $5\frac{1}{2}$ inches, as against a bore of $4\frac{1}{4}$ inches, and the valves, both on the same side and all their gear enclosed, are $2\frac{1}{4}$ inches in diameter. The ignition system

includes dry cells and coil; the carburetter is of the usual float feed type and lubrication by splash, with sight feed. As might be expected in a car designed with simplicity as one of its features, thermo-syphon cooling is employed. The transmission system includes a friction change-speed mechanism which, however, differs from the majority of such gears in that it is arranged for shaft drive to the rear axle. Both front and rear axles are fitted with Timken roller bearings, the former being a standard Timken product of I-beam cross section. The channel steel frame is carried on four semi-elliptic springs. The wheels will be fitted with solid tires as standard outfit, and $3\frac{1}{2}$ -inch quick detachable pneumatics, will be furnished at an extra cost.

A feature of the little wagon that will prove exceedingly useful is its ability to make very short turns. Two types of body are listed, one open and the other closed.

Tent For the Indianapolis Show.

Despite the fact that some two months ago the dealers of Indianapolis held an "open house" week which was denominated "show week," and which was designed to take the place of a conventional local show, the pressure has been too great to withstand and a "regular" show will be held during the week March 25-30. Contrary to the usual custom however, the exhibits will not be housed in a "palace" of wood, or a garden of stone. Instead, the Indianapolis Automobile Trade Association plans to conduct their first venture in nothing more than a "C" shaped canvas tent, which will be erected over the University Park square, permission to close the park and the adjoining streets having been obtained from the necessary authorities.

Reducing Moisture on Closed Car Windows.

The accumulation of moisture from passengers' breath on the windows of an enclosed car can be minimized by the use of small ventilators in the roof at the rear. Two ventilators, one at each side, will help considerably.

HOW CHICAGO CHECKED JOY-RIDING

Municipal Graft Discussed at Chicago Trade Association's Banquet—Chas. Y. Knight One of the Speakers.

The chief social function of the Chicago show period, the annual banquet of the Chicago Automobile Trade Association, occurred on Thursday night last in Hotel Sherman. It was well attended and was marked by no little enthusiasm. The chief speakers were Col. Charles Clifton, president of the Automobile Board of Trade, Charles Y. Knight, the inventor of the sleeve-valve engine, and William H. Sexton, corporation counsel of Chicago, the latter of whom spoke on the subject, "The Motor Car in Civic Service." In his address, Mr. Sexton dealt with more than platitudes or generalities and, among other things, indicated how Chicago had eliminated that form of graft known as "joy-riding."

"Chicago has been more or less provincial in this respect for several years," he said, "but now it is making rapid strides. The city first began using automobiles in 1897, and soon was spending \$45,000 per year for the service.

"There was a good deal of graft uncovered concerning the use of machines. For instance, one of the city officials went abroad and took with him a municipal car for use on the other side. This graft has now been stopped, for we have an agreement with a garage company for the hire of machines on necessary occasions at a cost of \$2.25 per hour. The bill for such service is not more than \$10,000 per year."

No Sunday Sales In San Francisco.

According to a resolution adopted by the Motor Car Dealers' Association of San Francisco, Cal., at its last monthly meeting the automobile salesrooms of that city will remain closed on Sundays, beginning with February, 1912. The resolution, which was passed unanimously, reads as follows:

"Resolved, That each member of the Motor Car Dealers' Association of San Francisco close to the general public his or its place of business on Sunday, and upon the following legal holidays, to-wit: New Year's Day, Fourth of July, Thanksgiving Day and Christmas."

American Horns Tooted at the Durbar.

Although the American flag did not fly, nor the American eagle scream at the Coronation Durbar in India, there was considerable American horn-tooting, nevertheless. The horns were the Dean Electric Co.'s Tuto horns and they were attached to the six specially prepared automobiles that were provided for the exclusive personal use of King George and of his gorgeously uniformed retinue of military officers and diplomatic attaches.

WHY THE TAXICAB TARIFFS ARE LOW IN LONDON

Scarcity of Street Cars and Elimination of "Dead Mileage" Are Contributing Factors But Excellence of British Maintenance Systems Is of Greater Importance—Rigid Police Inspection Which Insures Lessened Depreciation by Requiring Better Cabs and Drivers—London and New York Contrasted.

Though it is not possible to ascribe any one reason for the very noticeable difference in tariffs charged by London taxicab companies and those that operate in New York, and though there have been numerous attempts to reconcile the difference, taking into consideration very nearly every conceivable reason, there is one vital factor which has been almost totally overlooked, namely, the simple fact that in the British metropolis taxicabs are a necessity. Of course, residents of New York and its environs may find it difficult to view a taxicab in the light of a necessity. But be that as it may, the fact remains that in London they really are necessities and the statement is borne out by a brief resume of the conditions which exist.

It scarcely is necessary to point out that London is at once the largest, and the most thickly populated city in the world. And yet, despite this very evident fact, there is a truly remarkable scarcity of trolley lines; beyond one or two main lines which do not reach far from the beaten trail, there are none. As a consequence the public must needs depend for transportation on buses and taxicabs. The whole city is interwoven with a network of bus lines and there are more taxicabs in use in London, per capita, so to speak, than there are in any other capital city. At the last report there were some 8,000 of them, owned and operated mostly by large corporations, though a fair percentage are privately owned. That is to say, they are operated by owner-drivers who in most cases eke out a good living after the manner of their predecessors of the horsed vehicle era when Samuel Weller and his lineal descendants constituted London's transportation problem.

In New York, conditions are different, of course. There are innumerable trolley lines, there are elevated railways and there are the subways. So that taxicabs are not the necessity that they are in London. Rather they are a luxury and as such it is perhaps natural that they should be expensive. Those who have had occasion to ride in them will not need to be reminded that they paid 50 cents for the first two-fifths of a mile, and that if they rode further 10 cents more was registered on the meter for every additional fifth of a mile. It is not a very hard problem in mathematics to figure out that at that rate the fare for the first mile is 80 cents, and for the second and succeeding miles it is 50 cents. By way of contrast it is merely necessary to point out that in London the fare for the first

mile, and for each succeeding mile, is but a modest 16 cents. Waiting time is charged for at the rate of four cents for two and one-half minutes, or 96 cents an hour, as against \$1.50 an hour which is charged in New York.

The surface reason why London taxicab rates are so low is that the tariff is fixed by law. In New York there is no law which regulates the amount which may be charged. That is to say, there is no law which applies specifically to taxicabs. The only law in force at present relates to horse-drawn vehicles, and limits the legal rate of fare to \$1 for the first mile and 50 cents for each additional one-half mile. This law has been adjudged to obtain in the case of taxicabs also, so that in reality the legal rate of fare may be anything less than this rate, though it cannot be more. A few, a very few, taxicab operators charge the higher rate, though competition has practically forced the majority to use the lower rate.

Of course if the London taxicab operators could not exist and show a profit at the 16-cent rate which is fixed it is certain that the howl which would go up would be heard even in New York. That they can exist, however, is evidenced by the fact that little if any effort has been made to have the statutes revised to permit of the rates being raised. Whether or not rates in London are due to be increased in the near future remains to be seen; but there are indications that point that way. Not the least of them is that reports of the earnings of some of the large companies show shrinkage. For instance, for the year 1909, the Motor Cab Co., of Great Britain, paid a dividend of 7½ per cent., whereas for the year just ended the dividend paid was but 5 per cent. "Many of the companies have paid nothing at all," observes the London Daily Mail, in an article on the subject, "although they have had time to show their mettle. One or two companies which paid fairly well at the outset have already received a check and are now paying less than they did, or nothing at all." "Of course," the writer of the article in question is further moved to remark, "it is quite probable that the cabs owned by private proprietors pay better than those owned by big public companies; that is a common experience in all businesses; it is a matter of sound finance and economy of judgment."

Despite such alternate pessimistic and optimistic views, however, there is reason to believe that the outlook on the whole is rather more optimistic than pessimistic

that the larger companies really are thriving and making money. The weaker companies, those that are not properly financed and managed, go to the wall. This is quite natural and holds good in America and every other country. The stronger ones quite as naturally survive and pocket the profits. And the profits they do pocket are made at 16 cents a mile. This perhaps is the most peculiar part of it, judged by the mere fact that in New York transportation companies find it difficult—some of them find it impossible—to show a profit with the meters on their vehicles registering 50 cents on the drop of the flag and 10 cents for every fifth of a mile after the first two fifths.

"Dead mileage" is part of the answer—a large part of it, it may be added. "If we could cut out some of the dead mileage," remarked the head of one of New York's big companies, a company which operates some 300 cabs, "if we could keep our cabs in operation one-fourth as long again as we do we could reduce our rates considerably and still show a profit." In an effort to achieve this end, the same company recently hit upon the scheme of charging its customers just half the amount registered by the taximeters when the cabs were used during daylight hours. The result was a flat failure and entailed enormous loss. The volume of business was increased and so was the gasoline consumption, and the dead mileage and the depreciation. The result was that the company was compelled to abandon the plan. It was an experiment, of course, and though the loss was great the experience gained was such that it led the directors of the company to believe that a reduction of 33 1-3 per cent, instead of 50 per cent, would prove the desired remedy. Whether it will or not remains to be seen. In the meantime the company is to make the second experiment. Needless to say the results will be watched for eagerly.

In London there is very little dead mileage. The shape of the city and the distribution of business houses and residences is such that conditions are exceptionally good. Often it is possible for a driver to convey a fare to some not far distant point and without trouble obtain a fare for the return journey. Naturally this results in the multiplication of initial fares and as in a great many cases, taxicabs being used very freely, the journey is less than a mile there results a balance on the credit side of the ledger. This feature is helped materially by the fact that it is permissible

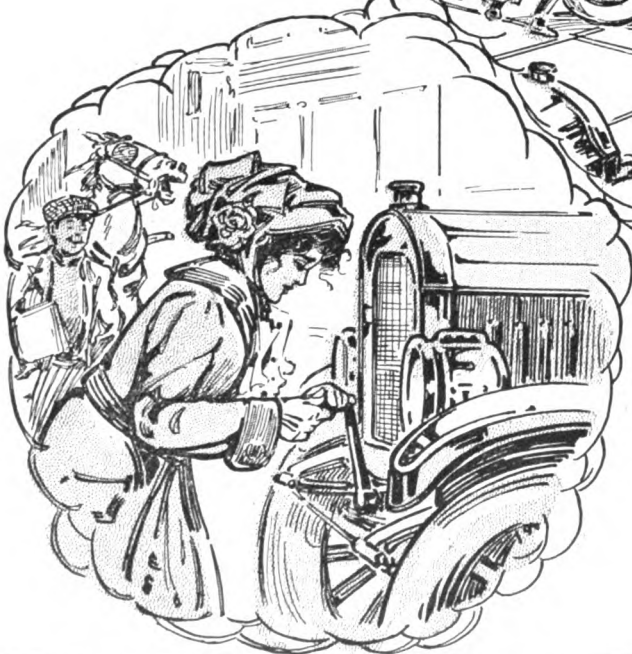
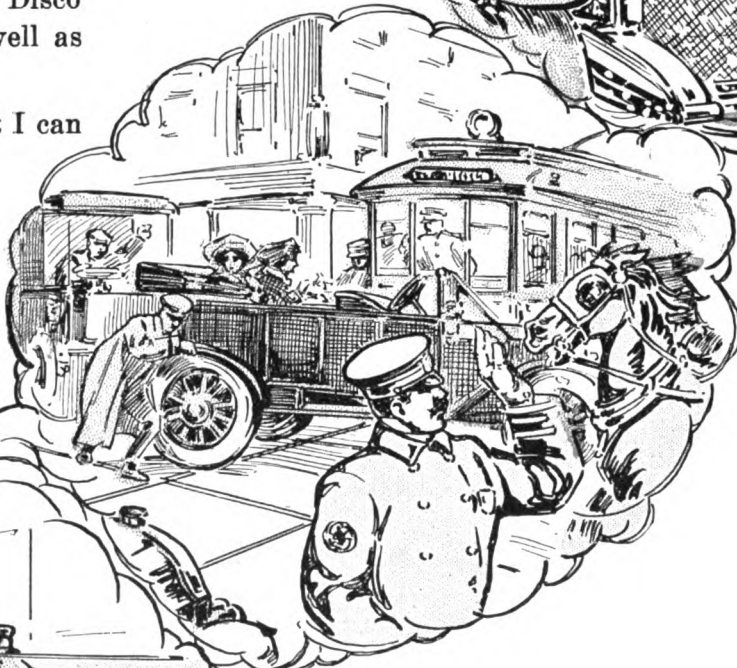
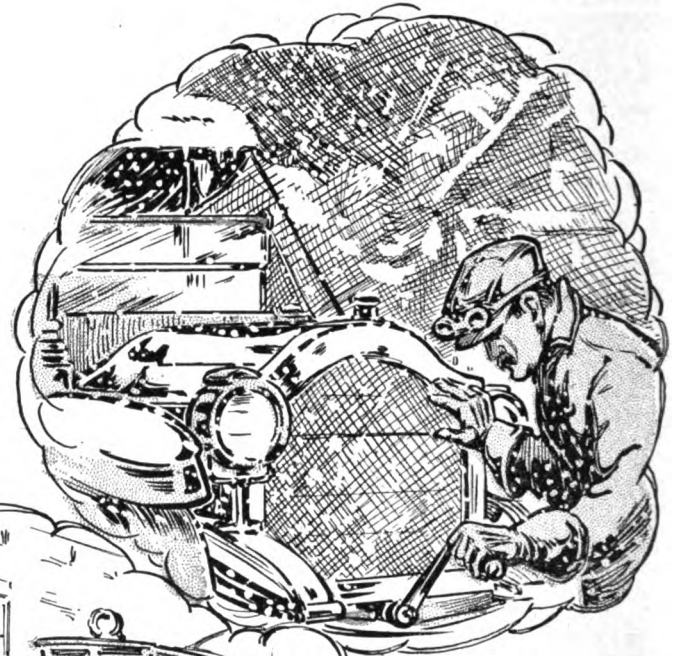
No More Cranking

**"Never Again"—
that's my sentiment
on the crank question.**

With the Disco Starter, my car now starts from the seat. I don't get out of my car in snow, rain or mud to twist that cussed handle. My wife can drive the machine anywhere alone without fear of having to start it herself.

In many emergencies, the Disco saves dangerous delays as well as embarrassment.

I can't afford a chauffeur but I can drive a party to the opera and start for home afterwards with all the grace and dignity of the millionaire and his liveried servants.



When I think of the small cost at which my car was equipped — when I sum up the luxury of simply pressing the button and starting the engine, no matter how cold the weather, no matter how long the car has stood — I can't see why we

didn't enjoy the Disco Self Starter long since.

All my friends who are getting new cars are insisting that the manufacturers or dealers shall equip them with Disco Starters, and all those who have old cars are making them up-to-date with this simple little device. It has but 12 parts, weighs but 4 pounds, and you can have it put on any car in less than three hours.

DISCO Self Starter

A little three inch handle on the dash (or any other convenient place) is the only visible sign of the modern car equipped with the Disco. Its extreme simplicity and absolute dependability account for its approval by the experts of the automobile world, and its adoption by the largest manufacturers.

Put Those Motoring Troubles Behind You!

Don't wait longer, for the practical, successful Self Starter is here—is being manufactured, sold and shipped at the rate of three hundred a day. Prompt deliveries are guaranteed. Any dealer or garage man who has not the Disco already in stock can quickly get it for you. Insist on the Disco—the Self Starter that has revolutionized the automobile business.

See it at any of our branches.

IGNITION STARTER COMPANY

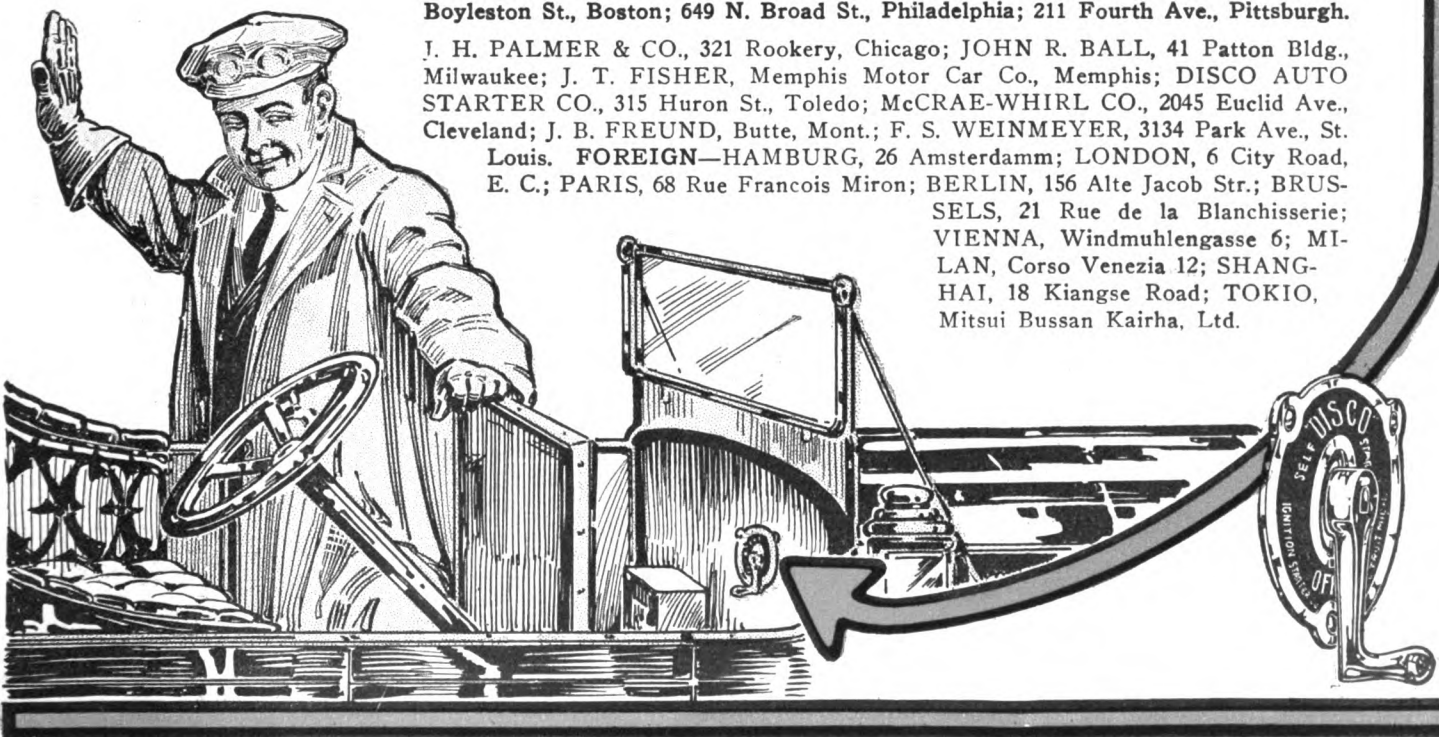
The Largest Manufacturers of
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FLEET OF MAXWELL TESTERS ON THE FROZEN HUDSON AT TARRYTOWN, N. Y.

for the British taxicab driver to pick up a fare anywhere on the streets. He may be hailed at any time and in the residential districts householders are furnished with whistles, one blast usually sufficing to bring a taxicab "moving some," as one person who recently returned from abroad put it.

It is true that taxicabs may be hailed on the streets of New York, too, though very few persons know it and the drivers of antiquated horse-drawn vehicles never fail to prey on the ignorance of the public in this respect by threatening the driver of a taxicab with arrest if he picks up a fare except at a regularly maintained cab stand. There has been not a little muddle over this very thing quite recently. Desiring to test the old law regulating the operation of horse-drawn vehicles the head of one of New York's big taxicab companies sought the advice of the corporation counsel. He decided that there is nothing in the law to prevent a fare being picked up anywhere.

On the strength of this ruling the taxicab company instructed its drivers to stop if they were hailed. One of them did so and picked up a fare at one of the Ferry terminals. He was immediately arrested and despite the corporation counsel's interpretation of the law was fined \$5. Since then there has been little trouble, however. R. W. Mead, who is president and general manager of the New York Transportation Co.,—which is New York's biggest company—states that the drivers of his cabs have been picking up fares "on hail" and that as far as he knows they have not been molested, though on several occasions the drivers of horse-drawn vehicles have attempted to intimidate the taxicab drivers.

"Undoubtedly it would be better," he said to a Motor World man, "if the laws could be so amended as to make it permissible beyond cavil for a driver to pick up a fare on the street, and it might make pos-

sible a reduction of tariffs." "But the elimination of a great amount of dead mileage is not the only factor which makes for low rates in London," he continued. "There is maintenance organization, for instance. In London and other foreign cities they are far ahead of us in such things and as a result depreciation is less. It has been stated that six years is the average life of a cab in London—that it is necessary to write off 162-3 per cent. a year for depreciation, but I think this is a conservative estimate. I have seen cabs in use that are four years old and that are every bit as good as the day they were bought. It seems to me that depreciation is rather a question of obsolescence because of the excellent system of maintenance and reconstruction which obtains. Depreciation in New York is greater principally because we have very poor roads and streets as a rule. For the average American cab it probably is necessary to write off as much as 33 1-3 per



MOTOR SLED EXTEMPORIZED AND USED BY FRANK B. WILLIS, OF INDIANAPOLIS

cent. a year, though for the better imported cabs 162-3 per cent. ought to be ample. But cabs cost more here than they do abroad, and therefore the amount of depreciation percentage must be greater. For instance, the best foreign cabs, far superior for the service to American products, cost in the neighborhood of \$1,500 to \$1,700 abroad, but we have to pay 45 per cent. duty on them, and even if we import the chassis alone and put on them the best bodies we know how to build the cost runs up close to \$3,000."

But whether British taxicab companies will or will not do so they are compelled by law to maintain their vehicles in well-nigh perfect condition all the time. They are required to be submitted for annual inspection, and if they are not up to the standard set by the authorities of Scotland Yard licenses are refused. To those who are not familiar with the extremely rigid police regulations in force in London, it probably will be a surprise for them to learn that even the dimensions of the cabs must be just so before they will be passed. In fact there is no part of a cab which is not covered in the specifications which form part of the law. For instance: "All parts connected, bolts and studs, and nuts, subject to severe vibration, must be fastened by lock nuts, or by nuts and approved spring or lock nut washers, to prevent their working loose and making a rattling noise, and any cab with lamp brackets, mudguard brackets, and other cab fittings loose and likely to cause unnecessary noise, will be regarded as unfit for public service." And further: "No ball and socket joints shall be pendant." "Every vehicle must be provided with, and maintain in use at all times, an approved means of preventing or limiting side-slip." In conformity with the last clause, nearly every cab in use in London is equipped with two steel-studded or other non-skid tread tires, one in front and one in rear; few tire chains are used.

It is such things which make possible cheap rates of fare because they insure the lowest possible depreciation. In the first place it insures that each cab must be in excellent condition when it is placed in service. It is not possible, as it is in New York, to obtain a license for any nondescript conveyance which is capable of moving under its own power and carrying a taximeter. In the second place it insures that cabs must be maintained in excellent condition, and for this purpose there are corps of expert mechanics at the garage of every large operator. The drivers, in the majority of cases, never touch their machines except to drive them. They are brought in at night and turned over to the garage force and unless a cab has been totally wrecked it is turned out in the morning in perfect condition. In fact, in some large institutions the maintenance staff even builds cabs. Parts which are worn or broken are replaced over night, cabs are

cleaned, tanks filled and the machinery adjusted by experts. For instance, it is the duty of one corps of men to adjust carburettors, another cleans spark plugs, another examines transmissions, another clutches, another brakes, and so on through the whole car.

Another thing which works to eliminate depreciation is that insofar as is possible every driver has the same car every day. Thus he becomes acquainted with it, so to speak, learns its idiosyncrasies, and can treat it with consideration. But the average British driver is more considerate than his American cousin anyway. It is the opinion of not a few who have opportunity to observe the tactics of typical British drivers that they are more careful, that they treat their cabs and the public with more consideration than do American taxicab chauffeurs. Recruited, as they are, largely from the ranks of the horse cab drivers, they are as a rule more familiar with the byways of the great city and often can make short cuts, returning empty and in the end the saving in gasoline consumption and depreciation is considerable.

Perhaps one of the greatest reasons why depreciation is comparatively low is that British companies "don't bang their cabs to hell," to quote a returned American traveler who also is interested in the taxicab business in America. Few companies operate their cabs under two shifts of drivers and few drivers will work more than 12 hours a day for more than four or five days a week. They don't have to, or at least they think they don't. "They make lots of money in the winter months," explained the same returned traveler, "and then they go over to the Continent in the summer and spend it." Part of the "earnings," of course, come from the "extras," which are not registered on the meters and which every driver considers it his privilege to appropriate. The biggest part really is earned—drivers are paid 25 per cent. of their takings, estimated at from \$8 to \$10 a day—and a small part is formed of "gratuities" bestowed by passengers. Thus the average driver earns, in one form or another, \$16 to \$20 a week, and as the much mooted cost of living is not as high in London as it is in New York he considers himself "well heeled" and as a rule lets it go at that.

Labor, too, is cheaper abroad, and that helps materially in permitting of low fares. The mechanic who is paid 50 or 60 cents an hour in New York is satisfied with 25 or 30 cents in London. Garage rents are lower, one reason being that for the most part garages are located outside the city limits. In fact, proprietors find it necessary to allow their drivers for the gasoline used in making the trip to and from the garage, but more often than not this is offset because passengers often are carried in both directions. Naturally the driver is "in" the cost of the gasoline for all drivers are charged for their fuel. In some cases

proprietors store quantities of "petrol" and sell it to their drivers, and in other cases drivers are free to buy their gasoline where ever they can obtain it most cheaply. It costs about 15 cents a gallon. Lubricating oil is furnished the drivers for obvious reasons.

There is probably only one other really big reason why British taxicab companies can make money at 16 cents a mile—and "extras" which they don't get. That is that there are no "privileges" as the really enormous amounts paid to hotels and restaurants in New York facetiously are styled. These "privileges," amounting in the case of the Hotel Knickerbocker to some \$20,000, it is said, and in other cases to more or less than this amount, representing 10 per cent. of the takings of the company from business originating at the various stands, must be paid by the public, that is by the riding public. At least one reason why taxicab rates in New York are not lower than they are is not shrouded in mystery.

In London there is no such thing. There are innumerable cab ranks all over the city and they generally are provided with some sort of shelter. Also in the majority of cases these shelter houses are provided with telephones so that nearby residents may order cabs from the nearest cab stand. Where the shelter is not provided with a telephone the resident may order a cab through the district messenger service.

It is not possible, of course, that the taxicab tariffs in New York ever should be as low as those in London; there are too many modifying conditions. Even supposing that the topography of New York were exactly the same as London and that the distribution of the population were the same there still would be too many factors which must be taken into account for as already has been pointed out the elimination of "dead mileage" is not the whole story. Lower rates may come; in fact, it is probable that they will come, for one new company shortly will place in operation in New York a line of taxicabs which may be hired at 50 cents a mile and \$1 an hour by the clock for waiting time. But before the rates can even approximate those which obtain in London it will be necessary not only to reconstruct the city, but also to reconstruct the American temperament!

Emergency Repair of a Battery Strap.

A broken storage battery strap can be temporarily repaired by binding the parts together with wire, or by driving a nail or a screw into the lead on each side of the break and connecting the two by several turns of wire. But these repairs will last only a short time, as the acid solution will dissolve brass or iron in an incredibly short time. They are very useful sometimes, however, to enable the car to get home under its own power, where the lugs should be "burned" together.

TOO SPEEDY FOR BRITISH RETAILERS

They Object to Motor Truck Because of Its Promptness—New Yorkers Would as Soon Have Aeroplanes.

Perhaps it is natural that the British retail merchant, precise and accustomed to having things done every day in the same way and at the same hour, just as his father and his grandfather did before him, should feel inclined to rebel somewhat at the changes wrought in his ancient and honorable routine by the substitution of motor trucks for horse-drawn vans for the delivery of merchandise from the warehouses of the wholesalers to his shop. Not that he has any particular objection to the speed or the superior capacity of the motor truck, or that he would wittingly block the wheels of progress, but because the newer method of transportation upsets the habits and customs of years, and anything that tends to change the old order of things is obnoxious to him.

Extraordinary as it may seem, this lopsided view of the case is taken quite seriously, and in some quarters the shopkeeper's ignorant protest is cited as one reason for the reluctance of some concerns to make the change from horses to motors for this class of service. A writer in a British motoring periodical thus sets forth this rarely-considered view of the matter:

"In my opinion, the reason why many would-be users of motor trucks are holding back lies in the necessity for reorganization of delivery times. This fact is not so much their fault as their misfortune. We are a conservative nation in many ways. Our delivery system is based on railway time and horse time. We know exactly how long it should take for goods despatched, say, in London to reach Glasgow by rail.

"Railway time does not so greatly affect mechanical transport as does horse time. Take the case of a large wholesale grocery firm. They have been accustomed to supply retail shops within a certain radius by means of horse vans, making an average speed of three miles per hour, carrying two to three tons of goods and visiting say half-a-dozen places in one district once per day. The moment mechanical transport is introduced, the average road speed jumps up to 10 to 12 m.p.h. with three or four tons of useful load.

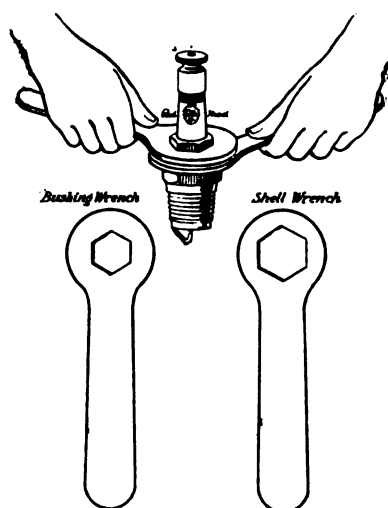
"It is argued that it is an easy matter to reorganize the deliveries, by increasing the districts, etc. Admitted that this can be done with little trouble, the difficulty does not end here. The retail shops object; their goods are delivered when they think they do not require them. For example: a shop nine miles from the central depot receives its consignment by horse-drawn vehicles at, say, 12 noon; by motor lorry, these goods

would arrive at 10 a. m., and further, allowing two trips per day per lorry, another retail establishment would receive its consignment at 4 or 5 o'clock in the afternoon instead of, say, mid-day. This is no imaginary trouble, and it must take time to educate the whole community to do business calculating their deliveries on motor time.

"In this direction I feel sure lies a field

Wrenches That Aid Spark Plug Handling.

When a monkey wrench three times too big for the job is used to remove a spark plug, it is only natural that if the wrench comes in contact with the porcelain its weight will in most cases cause the brittle substance to crack. And when it becomes necessary to remove the porcelain from a plug for cleaning, it does not often



happen that there are two wrenches that will just fit the shell and the bushing respectively, and the work usually is done with two of ill-assorted sizes. In order to avoid these inconveniences the Emil Grossman Co., 250 W. 54th street, New York, has evolved the two Red Head wrenches which are shown by the accompanying illustrations and which are furnished without charge with every set of four Red Head spark plugs. One wrench fits the shell and the other the bushing, so the plug can be removed or the porcelain taken out without difficulty from wrenches, and with a considerable saving in time and temper, to say nothing of porcelains. These wrenches are suitable for use with all standard plugs, and are of the right thickness and of the proper length for their work.

for very useful press work—a national education in modern methods of road transport. All those who have studied the problem will, I think, agree that deliveries and transport by road present no difficulties where distances exceed, say, three or four miles, but it is the short distances with house-to-house delivery that require very careful study. A service of mechanically-

propelled vehicles can be run economically under these conditions, as compared with our old friend, the horse, but considerable care is required in administration."

The American retailer apparently does not run quite so much toward system and routine—in fact, it would seem that he cares little or not at all when he gets his goods, provided he gets them in time. The only effect the introduction of motor delivery has upon the New York retailer apparently is to sharpen his desire for speed, and still more speed. At least, this is the conclusion that has been reached by H. C. Waltermyre, who rules the destinies of the five 3-ton Packard trucks constituting the present motor fleet of the wholesale grocery firm of Francis H. Leggett & Co., of New York.

"No, the motor truck delivery system does not cause the retailers any inconvenience whatever," said Waltermyre, when asked to compare the experience of his firm with the conditions dwelt upon by the British writer. "All they care for is to get their stuff just as early as it can be delivered, and, in fact, some of them are not satisfied even with that. For example, and to give an instance from real life, a storekeeper happens to think, at nine or ten o'clock in the evening, of some goods he needs, and he forthwith writes us a postcard by way of an order. And he is disappointed and rather put out that he does not get his order filled by the first trip the following day. 'Why, I ordered that stuff on Thursday, and I didn't get it till Saturday,' he will growl—but he doesn't remember to figure that his order probably did not reach our office until the trucks were all well started on the first Friday delivery. No, they won't make any fuss about the inconvenience of new schedules; they are much more likely to demand delivery by aeroplanes. We have had no trouble whatever with motor trucking, so far as the delivery end is concerned. The retailers like early deliveries; they like to get their orders filled promptly, and they like to see the big machines standing in front of their places—it looks like good business."

What May Cripple Lighting Systems.

In cars which are fitted with electric lighting systems including an engine-driven generator which charges a storage battery, the automatic cut-out which interrupts the connection between generator and battery, when the generator is not producing sufficient current to overcome the resistance of the battery, should be examined occasionally to make sure that it is in good working condition, and does not stick or refuse to act at the proper time. Otherwise the battery is apt to discharge itself through the generator when the latter is running at low speed, and the supply of electricity for lighting purposes will not be available when required. Further, the battery is liable to discharge itself below the normal point, with injurious results to the plates.

BRITISH VS. AMERICAN AUTOMOBILE INSURANCE

British System Characterized by Generous Provisions and Remarkably Moderate Rates—General Adoption of Royal Automobile Club's "Model Policy" Almost Standardizes the Business—One Policy that Safeguards the Motorist from All Manner of Ill Fortune.

Automobile insurance in Great Britain has recently become thoroughly standardized, and as a result is far cheaper than in the United States, owing chiefly to the work accomplished by the Royal Automobile Club in drawing up a "model policy," to the wording of which the insurance companies adhere, or are required to adhere—if they desire the business of members of the Royal Automobile Club. The "model policy" is, in truth, a model, far exceeding in liberality and scope the policies granted in this country; most of the more important insurance companies have adopted it as standard—taking care to give wide publicity to the fact that their new policies are formulated according to the "R. A. C." policy, as the club policy is called, and limiting the issuance of such policy to the members of the Royal Automobile Club and associated clubs. By this reciprocal arrangement the insurance companies gain the support of the "R. A. C.," while at the same time bringing new members into the club.

An American motorist, desiring to insure his car against all the adversities and misfortunes covered by the R. A. C. policy would have to take out at least four separate policies, which for a 40-horsepower car, valued at \$3,000, would cost him \$275 per year. The R. A. C. policy, affording as good, or better, protection, with far greater liberality in case of adjustments of small losses, and even including costs of legal suits brought against the insured in connection with an accident, would cost an English motorist, using a car of equal horsepower and price, only \$175—this policy including everything conceivable in connection with accidents, fire, theft, burglary, explosion, lightning, mechanical breakdowns, liability for injury of passengers, driver and third persons; property loss caused to third persons and a special compensation to the owner of \$5 per day for every day that the car is in the repair shop because of an accident. No American company makes good losses caused by laying up of the car for extended repairs, or gives any compensation for the time lost on account of such repairs.

The R. A. C. policy provides that:

Section 1.—The insurance company will pay to the insured all damage to any motor car belonging to him, occasioned by accidental collision or impact with any object, or by malicious injury or by passing over any artificial gutter or ridge, or by other accidental means, but only to the ex-

tent of the total sum named in the policy as the full value of the motor car. The insuring company agrees to pay all damages to lamps and accessories occasioned by accidental collision, as well as to tires when such damage is the direct result of an accident which causes damages to other parts of the motor car, for which compensation is payable. In addition to paying the actual damages, the insuring company will be responsible for the reasonable cost of removing the motor car from the scene of the accident to the repairers, and for their fair charge of delivering the same after repairs have been made. The company, however, is not responsible for any further damages done to the car by driving it under its own power after an accident, while the car is in a damaged or unsafe condition. If the makers of the car which has met with an accident have an establishment for repairs in the country in which the accident took place, the insured may require that the car be sent to the makers for repairs, provided the charges made by the makers are not higher than those by any repairer selected by the insurance company. In case the total cost of the repairs necessary on account of the accident does not appear likely to exceed \$25, the insured motorist is authorized to have such repairs executed immediately, provided he obtains a detailed estimate and forwards same, together with all particulars of the accident, to the insurance company's office.

Section 2.—The insurance company furthermore agrees to pay all sums which the insured shall become legally liable to pay to any person, firm or company, as compensation for accidental loss of life, or bodily injury, or damage to property or animals, or the law costs in connection therewith, provided the insured obtains the permit of the insurance company previous to settling claims, or incurring legal liabilities.

Section 3 covers damages to the car, occasioned by fire, lightning, explosion or self-ignition, to the full value of the car.

Section 4 includes all losses of car, parts, or accessories, by burglary or theft, (by persons not in the employ of the insured)—provided such damages are more than \$5.

Section 5 provides for payment of damages to the car in transit anywhere in Great Britain, the Isle of Man, and on the continent of Europe, as well as for all damages to be paid in case of accident on the continent of Europe, provided liability

to third parties (under section 2) does not exceed \$5,000.

In case of total loss the value of the car as given in the policy is considered as the replacement value, while in the event of dispute as to the amount of compensation in cases of accident three members of the Legal Aid Committee of the Automobile Club are chosen as arbitrators, whose decision is considered final.

The "General Conditions" provided for in the R. A. C. policy require that: (1) Each accident shall be held to include a series of accidents occurring in connection with, or arising out of, one event.

(2) In the event of an accident which may result in a claim under this policy or in police or other proceedings against the owner or driver, notice shall be given to the insurers. Such notice must be given in writing (and by telegram, if convenient) as soon as possible after knowledge of the accident has come to the insured or the insured's representative. The insured shall give full information as to the circumstances of the accident, and of all claims made, with names and addresses of witnesses and all persons concerned in the accident.

(3) No claim shall attach to the policy for any accident arising while the motor car is engaged in prearranged or organized racing or pace-making, or while engaged in prearranged racing against time, or is let on hire.

(4) The insurers shall at all reasonable times have free access to examine the said motor car by their authorized representative.

(5) The policy shall not cover loss or damages occasioned by, or happening through, earthquakes, invasions, foreign enemies, riot, civil commotion, or military or usurped power.

(6) All communications of any nature having reference to the policy, or to any claim arising thereunder to be made to the insurers (not to the Royal Automobile Club authorities.)

(7) The words "motor car" where used in the policy include "motorcycle."

With very slight deviations this policy has been adopted by a number of the leading insurance companies of Great Britain, each company naturally adding a few details, which, however, is no wise affect the general liberality of the policy and which additions or changes, moreover, must pass the scrutiny of the Legal Aid Committee of the Automobile Club before being

incorporated in the actual policy issued.

In addition to the benefits granted under the "blanket" policy passed upon by the R. A. C. and accepted as standard, the motorist may insure himself and his car, his passengers, driver, rugs, baggage, coats furs, etc., by simply filling out so-called "extra benefit clauses" and paying a small additional premium. The premiums required for the various additional insurances are very small and differ but slightly in the various companies. In the main they provide for:

Mechanical breakdowns from any cause (on cars under two years old, full damage; over two and under four years old, damage in excess of \$15; over four years old, damage in excess of \$25; over seven years old, damage in excess of \$50)—premium for this insurance: 20 per cent. of R. A. C. "full" premium.

Loss of rugs, furs, baggage by theft or fire (limit \$50 on each theft or fire)—premium \$2.50 per car, regardless of price or horsepower.

Special compensation to owner during accident repairs (\$5 per day, not exceeding 50 per cent. of repair costs)—premium 25 per cent. additional.

Accidents to owner (death, \$5,000; loss of limb or eye, \$2,500 each, limit \$3,750; total disablement, limit 26 weeks, \$30-\$35 per week)—premium for owner alone \$5, for owner and wife together \$7.50.

Accidents to passengers (death, \$5,000; loss of limb or eye, \$1,250 each; total disablement, limit 26 weeks, \$30 per week)—premium graded according to seating capacity of car. For five-passenger touring car premium is \$15.

Accidents to chauffeur (covering full legal liability of insured for all occupations as chauffeur, servant, etc., and full medical expenses)—premium \$3.50 per driver.

When compared with the expensive policies of American insurance companies, under which the insured cannot even recover for damages amounting to less than \$25, and must stand for the first \$25 damage in any one accident, the English policy is the acme of liberality.

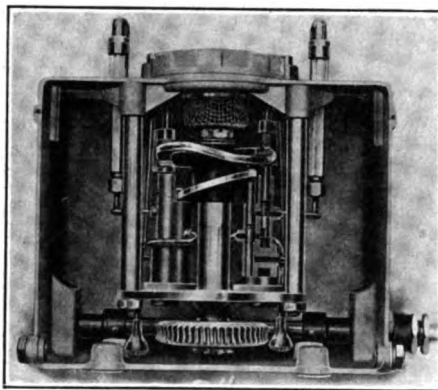
Five Cars Bring \$130 at New York Auction.

There was a genuine "bargain sale" on Tuesday last, 6th inst., at the corporation yard, in West 125th street, New York City, and automobiles went for the proverbial "song." Five self-propelled vehicles of hoary vintage and in somewhat dilapidated condition went under the hammer and together brought the munificent sum of \$130.50—or an average of \$26.10 each. The cars were seized as public obstructions in front of a garage in West 150th street several months ago, from which they were turned out because the owners had not paid storage. Two other cars seized by the city in a similar way were offered for sale, and one was redeemed by the owner, and a \$4,000 model of 1906 was held for another sale.

BOSCH ENTERS LUBRICATOR FIELD

Brings Out Mechanical Force-Feed Oilier of Ingenious Construction—Simplicity Its Chief Characteristic.

Supplementing the extensive line of Bosch magnetos and other ignition apparatus there has been added a mechanical force feed lubricator which is as distinctly original as it is new. In fact it is the very latest product of the Bosch Magneto Co., and though it cannot fail to be of interest for this reason alone, for there are few other necessary parts of an automobile that are better known all over the world, its chief claim to distinction lies in the fact that it is a radical departure from anything else of its kind. Needless to add, it resembles all the other Bosch products



THE NEW BOSCH OILER

in one essential feature, namely, it is well and compactly made of the best materials and exhibits all their earmarks of quality.

As may be seen in the accompanying illustration the device is exceptionally simple and consists of the minimum possible number of moving parts, the whole mechanism being enclosed in a smooth metal case which also serves as the oil reservoir. The prime mover is a central shaft arranged vertically in the case. It is worm driven from a horizontal shaft which takes its motion from any convenient source, the direction of rotation being immaterial, and carries at its upper end two disk cams, one of which actuates the pump plungers and the other the piston valves which control the flow of oil. Both the pump plungers and the piston valves are arranged circumferentially around the cams, the rotation of which serves to give both the plungers and the valves a reciprocating motion. Thus there are no check valves, springs or other comparatively delicate parts to get out of order or to require frequent adjustment. The quantity of oil fed at each stroke of the plunger may be adjusted by means of a single screw, adjustment being quite a simple matter and requiring no other tools than a screw driver.

In the oilers arranged for sight feed, the

pump plungers are given a double stroke which results in the forcing of one charge of oil to the bearing, and the other to the sight feed glass. By an ingenious arrangement, the sight feed glass is relieved of all pressure, and its breakage, even, would not result in interference with the feed to the bearing. The new oilers may be arranged to drive from either side or from the rear, the direction of rotation, as before mentioned, being immaterial for the reason that the disk cams are interlocked. Their movement with relation to each other therefore is the same and the proper lead is given the piston valves regardless of whether the movement is clockwise or anticlockwise.

Gears in Mesh Cause a \$200,000 Fire.

What is probably the most unusual accident in connection with leaving the reverse gears in mesh while stopping before a house, occurred on Wednesday of last week in Attleboro, Mass., and resulted in a fire which threatened for a time to destroy the entire business section of the town. The automobile which caused the conflagration was standing in front of the Opera House block, with the reverse gear in mesh. One of the party, not knowing this, attempted to start the machine, with the result that the car jumped backward, smashing through a show window, and setting fire to the contents of the store. The gasoline tank was broken in the smash and the fuel added to the fire, which quickly spread to the whole block. Damage exceeding \$200,000 was done before the flames were extinguished.

Export Figures of Automobile Leather.

Due to the enormous increase of automobiles in all parts of the world, the use of leather for their upholstery has increased in proportion, and exports of leather destined for this particular purpose have grown to such an extent as to be listed separately by the government in its statistics. During the month of December, 1911, \$11,074 worth of leather for automobiles and carriages was sent abroad, while for the full year of 1911 the figures amounted to \$105,376 worth. No comparison with the preceding year can be made, as the government did not list automobile leather previous to July 1.

S. A. E. Begins Enrollment of "Affiliates."

The Packard Motor Car Co., Hudson Motor Car Co., Standard Welding Co., Carnegie Steel Co. and the Royal Equipment Co. have been elected affiliate members of the Society of Automobile Engineers. This is a new class of membership recently instituted by the society and is open to firms or corporations engaged in the manufacture of automobiles, or parts or accessories thereof, all other memberships in the society being of a personal character. Each affiliate member has the right to designate six employees, or other representatives, to participate in the meetings of the society.

LAZANSKY DEFENDS HIS BUREAU

In Annual Report Resents Charges of Extravagance—Receipts Top \$900,000—83,961 Registrations in 1911.

Although the fiscal year for the registration of machines and chauffeurs in New York State only ended last week, the annual report of the Secretary of State, Edward Lazansky, already has been made public, the registrations applied for since December 31, 1911, naturally being in the 1912 allotment. The report shows that during the year 1911, 83,961 motor vehicles were registered, as compared with 62,655 in the preceding year, an increase of 21,306, or nearly 32 per cent. The number of licensed chauffeurs increased from 27,416 in 1910, to 35,807 in 1911, and the number of registered dealers from 1,800 to 2,400.

Of the total registrations last year about 50,000 were recorded by the New York office of the Secretary of State, nearly 20,000 by the Buffalo office and nearly 15,000 by the Albany office.

In connection with the revision of the Callan law, which on several occasions has been advocated by the opponents of the present law, the Secretary does not hesitate to place himself on record as opposing any such change or amendment. "At this time," he reports, "no changes in the present law will be recommended—firstly, because there is no demand for them, and, secondly, because the law is in its infancy and should be tried out under developing conditions before further amendments are submitted."

Defending his bureau against charges of extravagance and wastefulness, the Secretary explains various items in the maintenance cost, and professes himself unable to understand why the expense of collecting the automobile receipts in other States is so much lower than in New York. "I do not think," he says, "that there could be a more economical administration of the law as it is now on the statute books than has been given by this department, and the percentage of expense to the receipts will be even lower next year."

"For instance, there is a charge for number plates in this report. It includes those paid for after I came into office which were ordered by my predecessor, and for those for this year. In an ordinary business there would be about \$35,000 on this account alone that would be carried over as an expense of this year, instead of being figured in the 1911 report."

"It appears," continues the report, "that it costs about 24½ per cent. of the entire receipts of the bureau to maintain it during the year 1911. It must be borne in mind that the expense bears no relationship to the amount of business. It would not have cost any more if the fees were

twice those provided by statute. After August 1 of each year original registrations are made at one-half fees. In any event, it must be remembered that the bureau during 1911 has received moneys and done work incidental to 1910, 1911 and 1912 registrations and licenses, 1911 and 1912 number plates costing \$68,253.72 and 1911-1912 badges costing \$3,233.19 have been paid for, \$752.37 for equipment incurred by the previous administration and \$5,352.38 for equipment incurred by the administration, total, \$6,304.75, and other expenses amounting to \$1,985.78 were paid for this year. During 1912 upward of \$850,000 will be received for 1912 registrations and licenses and the major portion of the work incidental thereto was done in 1911. Up to January 1, 1912, the total receipts for the 1911 registration were \$901,334.37. Since during 1911 the bureau was engaged on 1910, 1911 and 1912 registrations, it is impossible to determine what it cost the State to receive that amount of revenue.

"From January, 1911, to December, 1911, the force was reduced from 180 to 124 at a monthly decrease in salaries of nearly \$2,000, although with 124 in January, 1912, much more work will be done than was done in January, 1911, by 180. This difference of \$2,000 does not really show the exact nature of the reduction. For there have been added to the force five inspectors whose duties are to assist the police in apprehending violators of the motor vehicle law. Their monthly salaries aggregate \$500.

"Two new cashiers were necessary owing to the extension of the work of the New York city office and the opening of the Buffalo office. Salaries of both are \$300 per month, annitional labor for the handling of about 130 tons of number plates, cost about \$300 per month and raises in salaries amount to about \$400 per month. Therefore, despite an additional monthly salary increase of \$1,500, salaries have been reduced from \$10,144.02 per month to \$8,221.01 per month. It is hardly possible that this latter amount will be reduced during 1912 because the work is constantly increasing; need must be given to fair requests for an increase in salary made by competent workers and because it would not be wise to reduce in times when the work is less a force which is necessary and faithful in very busy days and which makes up an effective working whole at such times."

When Wires Break Inside the Insulation.

While not a frequent occurrence, it is not an unheard of thing for a wire to break inside of its insulation, giving no exterior indication of the fracture. This, in the case of a low-tension ignition wire in particular, may cause all kinds of queer antics on the part of the motor, and before pulling things to pieces to look for mysterious ignition troubles, it is a good scheme to make sure that there are no hidden breaks.

STATE CAN'T MULCT UNCLE SAM

Federal Cars Need Not Pay Registration Fees, Attorney-General Declares—No Licenses for Soldier Drivers.

According to an opinion handed down by Attorney-General Carmody on Saturday last, 27th ult., the State of New York is not entitled to demand fees from the Federal government for the registration of the latter's automobiles operated in this State. The attorney-general also goes further and declares that officers and enlisted men in the Federal service, who may be detailed to operate such machines, need not be licensed as chauffeurs.

The opinion is in line with a ruling made several years ago when the point was raised and with the generally accepted tenet that a State cannot impose a tax of any kind upon the use of the Federal government of its property located in such a State.

"As the fee for automobiles varies in proportion to the horsepower, and thus roughly to the cost of the vehicle, and as it is imposed in lieu of all taxes," says the attorney-general, "it is clear that it is a tax, and there can be no doubt that it is imposed upon the use of property. I am of the opinion, therefore, that the Secretary of State cannot demand a fee for the registration of these cars."

Injured Guest Sues For \$10,000 Damages.

While German courts on several occasions have decided that a guest who pays nothing for an automobile ride, cannot sue the owner of the car if something happens, American courts have not as yet established a valid precedent in similar cases. It is, however, likely that this question will be threshed out thoroughly as the result of a suit which has been brought in the Ohio Supreme Court, by Thomas Hanlon, of Cincinnati, against Charles Eisen, treasurer of one of the largest candy manufacturing concerns in Ohio. Hanson claims that he entered the automobile belonging to Hisen, at the latter's invitation, and that during the trip Eisen lost control of the steering wheel and ran full tilt into a telephone pole. He alleges furthermore that he tried to jump out when he saw the collision impending, but that the whole accident happened so quickly that he was dashed out of the car and landed on his head on the sidewalk. He considers the knock worth \$10,000 and consequently has instituted proceedings for that sum against his former friend.

Physicians as Purchasers of Cars.

According to statistics gathered by the Maxwell-Briscoe Motor Co., of the 51,000 Maxwell cars that have been produced, 16,527 are in the hands of physicians, a proportion that is nothing short of remarkable.



999,138. Demountable Rim. Lewis Edward Younie, Portland, Ore., assignor to The O'Gorman Younie Company, Portland, Ore., a Corporation of Oregon. Filed June 12, 1910. Serial No. 568,153.

1. In a demountable rim, the combination with a fixed rim; having a conical surface; of a tire rim; an intermediate ring secured to the tire rim with the major portion of its surface free to move relatively to the tire rim as the tire rim and ring are flexed, said ring having an inner conical surface, and being thin radially relatively to its width to permit of its yielding to the form of any irregularity in the fixed rim; and means for securing the ring on the fixed rim.

999,160. Automobile Sled. Vernon Grover, Mina, S. D. Filed Aug. 25, 1910. Serial No. 578,924.

A sled including spaced parallel runners, upper parallel driving and driven shafts journaled in fixed bearings on the runners, slidably adjustable bearings mounted in the runners and disposed below the plane of the shafts, driven shafts mounted in the slidably mounted bearings, aligning sprocket gear wheels fixed to the shafts, a propelling chain extending around the sprocket gear wheels and arranged thereon to present upper and lower runs and front and rear runs, the lower run being operatively extended below the plane of the lowermost points of the runners for effective driving contact with the surface on which the sled is supported, and a controlling mechanism operatively connected with the slidable bearings and adapted for operation to move the bearings to positions to cause the end run of the driving chain to be moved forwardly and upwardly whereby the lower run of the chain will be disposed above the plane of the lowermost points of the runners.

999,195. Starting Device for Internal Combustion Engines. George J. Anderson, West Chazy, N. Y. Filed Jan. 3, 1911. Serial No. 600,583.

1. In a starting device for internal combustion engines, a stationary housing, a ratchet ring secured in the housing, the teeth of the ring being on its inner periphery, a hand crank, a shaft on which the hand crank is mounted, said shaft having a tubular portion extending into the housing and supported by one end thereof, a starting shaft supported by the other end of the housing and extending thereinto, and also into the bore of the tubular portion of the first-mentioned shaft, a disk encircled by the ratchet ring and having a hub portion secured in the bore of the tubular portion of the first-mentioned shaft, the face of the hub having radial notches, a coupling member carried by the starting shaft within the aforesaid bore, yielding means for normally engaging said coupling member with the aforesaid notches, and radially slidable pawls carried by the disk and engageable with the aforesaid ratchet ring for locking the disk against reverse motion.

999,197. Spring Wheel. Hans C. Bergerrud, Fergus Falls, Minn. Filed July 13, 1910. Serial No. 571,795.

In combination, a wheel having a rim

formed with a channel, an auxiliary tire for the wheel, and a series of springs connected to the rim and tire and interposed therebetween, each spring consisting of two members hingedly connected to each other, one of the members being formed of gradual curvature the end of which is pivotally attached to the rim, and the other member being formed of compound curvature the end of which is removably attached to the tire, whereby extended bearing surfaces are formed for contact with the tire.

999,302. Pneumatic Tire. Mark A. Dees, Pascagoula, Miss. Filed Sept. 12, 1910. Serial No. 581,519.

1. In a pneumatic tire, the combination of an outer casing, an inner tube, an envelop within said outer casing incasing said inner tube, having separable edges at its inner circle, a ring within the inner circle of said envelop, and means carried on the inner side of said ring to which the separable edges of said envelop are connected.

999,343. Spark Plug. Albert Schmidt, Flint, Mich., assignor to Champion Ignition Company, Flint, Mich., a Corporation of Michigan. Filed July 26, 1909. Serial No. 509,526.

1. A device of the character described comprising a bushing, an insulating member having an enlargement within said bushing, and a member surrounding the insulating member within the bushing in engagement therewith and provided with an annular groove in its end face forming at one side thereof a yielding annular lip adapted to be formed outwardly by its engagement with said enlargement.

999,350. Windshield for Automobiles. Almer B. Thomas, Hardwick, Vt. Filed Feb. 26, 1910. Serial No. 546,254.

1. In combination with a steering post and dash, a protector secured to the dash at its front end, and a support for the rear upper end of the protector, with means for detachably securing the said support to the steering post, and means for folding the support on the post, substantially as described.

999,382. Boot Holder. Axel Lundgren, Chicago, Ill. Filed Nov. 14, 1910. Serial No. 592,138.

1. A boot holder of the class described, comprising in combination a boot arranged to be placed over the tire of a wheel, a boot holding member, one end of which is secured to one end of said boot, and arranged to bear against one side of a wheel rim, boot tightening means secured to the other ends of said boot and boot holding member, and a screw, threaded in said boot holding member at a point between the ends of said boot tightening means and arranged to bear against the side of the rim, opposite to the side engaged by said boot holding member.

999,402. Inflated Tire. Amos J. Roussey, Fort Wayne, Ind., assignor or one-third to Walter F. McLallen, Columbia City, Ind. Filed May 12, 1910. Serial No. 560,846.

In combination with a wheel rim, two oppositely disposed annular supporting shields secured at their inner edges respectively to said rim, and each having at its outer perimeter, upon the inner side thereof, a back-turned annular flange, and also, upon its outer side opposite said flange, a reinforcing fillet, an annular flexible shoe having oppositely extending wings adapted to engage respectively with said flanges, the outer portion of said shoe extending laterally and resting upon the respective

fillets, and a tube extending between the shields within the outer circumferences thereof and being adapted to hold said wings in connected relation with said flanges when inflated, said shoe being so formed and held that its extended sides become compressed diametrically inward against said fillets when its central portion is pressed outwardly by the inflated tube.

999,426. Gas Engine. Baxter M. Aslakson, Salem, Ohio. Filed Oct. 19, 1907. Serial No. 398,156.

1. A gas engine containing a fuel chamber and comprising a valve between the chamber and a working cylinder, controlling the fuel admission to the latter, an inlet valve controlling the charge supply, to the fuel chamber, an inlet valve controlling the gas supply for the fuel and arranged to open independent of the charge supply valve, valve rods, pivoted levers adapted to depress one valve rod and elevate the other to unseat the first and last named valves, and means actuated from the engine for operating said lever.

999,437. Spring Wheel. Charles I. Dodson, Pittsburg, Kans., assignor to Funk Brothers, Chicago Heights, Ill. Filed Sept. 7, 1910. Serial No. 580,846.

A vehicle wheel embodying a rim; spokes secured to the rim and provided with terminal projections; a hub having openings into which the projections may be slid transversely of the hub, to register therein against withdrawal longitudinally of the spokes; screws mounted in the hub and adapted to bear upon the projections of the spokes; hub-engaging lock nuts upon the screws; and plates applied to the ends of the hub, to hold the spokes in place within the hub, one of said plates having ribs adapted to bear against the peripheries of the lock nuts, to hold the same against rotation.

999,459. Face Protector. Fred Shermon Lozuaway, Portland, Ore. Filed Oct. 20, 1910. Serial No. 588,190.

1. A face protector comprising a wire frame adapted to be secured upon the head, and having a depending portion at the front—and a plate having a central opening, secured upon said depending portion so that said opening will stand before the eyes of the wearer.

999,462. Automobile Controller Lever Lock. Franklin C. Miller, Easton, Pa. Filed Mar. 7, 1910. Serial No. 547,808.

1. The combination of a controller having a chambered handle at its outer end, holding means for the controller, including a reciprocatory member located alongside the controller and projecting at one end into the handle, a combined actuating and key-released locking device arranged within the said chambered handle and swiveled upon the end of said reciprocatory member, said device normally projecting at one end from the outer end of the handle so as to form a push button, whereby the reciprocatory member may be actuated and released by pressing inwardly on the push button, said push button having a key-hole to receive a key for locking it against such inward movement, and a spring for holding the push button in said projecting relation.

999,485. Apparatus for Cleaning Castings and the Like. Charles W. Carolin, Detroit, Mich., assignor to Enterprise Foundry Co., Detroit, Mich., a Corporation of Michigan. Filed Sept. 15, 1910. Serial No. 582,117.

Casting cleaning apparatus comprising a closed casing, an apertured suction pipe provided with a nipple on its upper face and adapted to rest on the floor of the casing, an air blast pipe within the casing from a source of supply of air under pressure, an inspirator union on the outlet end of the pipe, a flexible suction pipe connecting the union and the plate nipple, a flexible hose leading from the outlet of the inspirator union, and a discharge nozzle for the hose.

999,496. Device for Locating the Defectively Operating Parts in Automobile Motors and Other Mechanism. Leonard B. Gaylor, Stamford, Conn. Filed Mar. 15, 1910. Serial No. 594,494.

1. A device for the purpose stated, embodying a hollow combined ear piece and diaphragm casing entirely open at both sides, a diaphragm in the casing, a nipple centrally connected to the diaphragm, and a rigid test rod attached to said nipple.

999,506. Air-Tight Valve for Pneumatic Tires. Morris Levrant, New York, N. Y. Filed Dec. 3, 1910. Serial No. 595,360.

1. An air-tight valve for pneumatic tires comprising an interiorly threaded tubular part with end flange, a hollow screw with flat head engaging the threaded portion of said part, an inner flange loosely on the screw, a washer between the screw head and said flange, an outer flange loosely on said screw having an inner rim, a washer around the screw between said rim and the end flange of the tubular part, and means for closing the opposite end of the bore of the latter.

999,511. Wheel Tire. Joshua D. Marvil,

Laurel, Del. Filed Apr. 3, 1909. Serial No. 487,692.

1. A rim for a wheel comprising a plurality of spring carrying sections having contiguous ends engaging each other, the parts of each pair of spring carrying sections being held intact when removed from and applied to the rim and having the springs terminally secured thereto, the pairs of spring carrying sections being individually removable from and applicable to the rim without disturbing the remaining pairs of sections or the cooperating parts of the wheel, a part of the sections having keys interposed between the ends thereof and the remaining part of the sections having turn-bars at their ends to separably secure the pairs of spring sections to different portions of the wheel rim.

999,518. Explosive Engine. Frederick W. Peck, Detroit, Mich. Filed Feb. 18, 1907. Serial No. 357,808.

An explosive engine comprising two pairs of opposed cylinders located side by side, the cylinders of each pair being disposed in axial alignment, a crank case between said pairs of cylinders to which the cylinders of each pair are detachably connected, a relatively large crank shaft journaled in the case having two opposed cranks, shaft bearings in said case extending to the faces of said cranks and having flattened sides, pistons in said cylinders, four independently removable rods detachably and adjustably connecting in pairs the pistons in the axially aligned cylinders, said rods embracing the flattened sides of the shaft bearings adjacent the faces of the cranks to keep them within the area of the bore of the cylinders, said cranks being greater in width than the horizontal spaces between the parallel piston rods to afford said

cranks the required transverse area, and a single connecting rod connecting each pair of pistons to one of said cranks.

999,534. Multiple Unit Coil. Ernest C. Wilcox, Meriden, Conn., assignor to The Connecticut Telephone & Electric Co., Inc., Meriden, Conn., a Corporation of Connecticut. Filed Jan. 10, 1910. Serial No. 537,185.

1. In electric apparatus, a source of current, a duplicate vibrator comprising independent vibrator elements, an induction coil, a casing for said vibrator and coil, contact members on said casing adapted to effect electrical connection automatically with one of said vibrator elements upon the insertion of said duplicate vibrator in said casing, and contacts on said casing arranged to effect electrical connection automatically with the primary and secondary windings on said coil upon inscription of the same within the casing to connect said coil and vibrator in series with said source of current.

999,561. Multiple Cylinder Engine. Rudolf Hennig, Hamburg, Germany. Filed Apr. 27, 1908. Serial No. 429,426.

1. A multiple cylinder internal combustion engine, comprising a plurality of cylinders arranged in longitudinal and transverse rows, the transverse rows each consisting of more than two cylinders formed into a unit, a combustion chamber common to the cylinders of each unit, said units being arranged directly against each other, pistons in said cylinders, crank shafts corresponding in position to said longitudinal rows of cylinders, connecting rods between said crank shafts and said pistons, gearing connecting said crank shafts and said valves.

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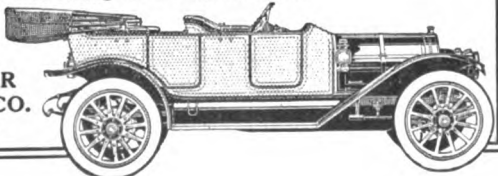
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INDEX TO ADVERTISERS



A		H		P	
Abbott Motor Co.....	802	Hartford Auto Parts Co.....	794	Packard Electric Co.....	803
Ajax-Grieb Rubber Co.....	788	Hartford Suspension Co.....	737	Parish Mfg. Co.....	786
American Ball Bearing Co.....	743	Havers Motor Car Co.....	794	Penn Spring Works.....	727
American Motors Co.....	800	Haynes Automobile Co.....	801	Perfection Spring Co.....	787
American Starter & Carburetor Mfg. Co.....	799	Henderson Motor Sales Co.....	802	Petrel Motor Car Co.....	799
Anderson Spark Plug Co.....	786	Hot-Spark Plug Co.....	795	Pittsfield Spark Coil Co.....	747
Apple Electric Co.....	786	Hupp, R. C.....	800	Pullman Motor Car Co.....	799
Argo Electric Vehicle Co.....	800	Hupp Motor Car Co.....	799		
Automobile Supply Mfg. Co.....	796	Hyatt Roller Bearing Co.....	794	Q	
B		Hydraulic Pressed Steel Co.....	787	Queen Mfg. Co.....	790-91
Badger Brass Mfg. Co.....	798	I		Quimby, J. M., & Co.....	746
Baldwin Chain & Mfg. Co.....	795	Ignition Starter Co.....	780b-780c	R	
Barthel, Daly & Miller.....	804	Inner Shoe Tire Co.....	786	Rajah Auto & Supply Co.....	796
Bartholomew Co.....	789	International Accessories Corp.....	747	Remy Electric Co.....	740
Benz Auto Import Co.....	728	Inter-State Automobile Co.....	794	Royal Equipment Co.....	798
Bicycling World & Motorcycle Review	783	J		S	
Bosch Magneto Co.....	733	Jamestown Wheel & Mfg. Co.....	787	Sackman Mfg. Co.....	803
Bossert Co.....	795	Jeffery-DeWitt Co.....	803	Safety Tire Gauge Co.....	787
Bower Roller Bearing Co.....	798	Jeffery, Thomas B., Co.....	801	Salisbury Wheel & Mfg. Co.....	798
Briggs-Detroit Co.....	799	Jones Speedometer.....	796	Sampson, Alden Mfg. Co.....	730
Brown-Lipe Gear Chapin Co.....	796	K		Schrader's Son, A., Inc.....	789
Brush Runabout Co.....	370	Kellom, Chas. F., & Co.....	787	Selden Motor Vehicle Co.....	804
Rush Mfg. Co.....	786	Kelly-Springfield Tire Co.....	746	Shawmut Tire Co.....	746
C		Kinsey Mfg. Co.....	793	Smith, A. O., & Co.....	803
Cartercar Co.....	801	Kinsler-Bennett Co.....	803	Sparks-Withington Co.....	794
Century Electric Car Co.....	798	Kissel Motor Car Co.....	736	Speedwell Motor Car Co.....	801
Champion Ignition Co.....	797	Kline Motor Car Corp.....	804	Splitdorf, C. F.....	797
Champion Spark Plug Co.....	734	Knox Automobile Co.....	802	Springfield Metal Body Co.....	787
Clark-Carter Automobile Co.....	783	L		Standard Roller Bearing Co.....	787
Classified Advertising.....	785-86	Lauth-Juergens Motor Car Co.....	792	Standard Oil Co.....	795
Colby Motor Car Co.....	802	Leather Tire Goods Co.....	786	Standard Tire Protector Co.....	786
Colonial Electric Car Co.....	802	Locomobile Company.....	786	Stearns, F. B., Co.....	801
Columbia Motor Car Co.....	730	Lovell-McConnell Mfg. Co.....	Inside B. C.	Stewart & Clark Mfg. Co.....	726
Continental Motor Mfg. Co.....	786	M		Stromberg Motor Devices Co.....	729
Corbin Motor Vehicle Co.....	802	Mais Motor Truck Co.....	799	Studebaker Corp.....	738
Covert Motor Vehicle Co.....	800	Manhattan Electrical Supply Co.....	797	T	
Cramp, Wm. & Sons, Ship & Engine Building Co.....	796	Marion Sales Co.....	802	Thomas, E. R., Motor Car Co.....	786
Crosby Company.....	800	Maxwell-Briscoe Motor Car Co.....	730	Times Square Auto Co.....	784
D		Mayo Radiator Co.....	727	Timken Roller Bearing Co.....	731
Dayton Motor Car Co.....	730	McIntyre, W. H., Co.....	799	U	
Dayton Rubber Mfg. Co.....	786	Metz Co.....	802	Union Sales Co.....	799
Dean Electric Co.....	731	Michelin Tire Co.....	796	United Rim Co.....	794
Diamond Rubber Co.....	783	Michigan Buggy Co.....	803	U. S. Auto Horn Co.....	798
E		Miller, Chas. E.....	746	United States Motor Co.....	F. C. 730
Electric Welding Products Co.....	792	Moline Auto Co.....	788	United States Tire Co.....	Inside Cover-725
Empire Tire Co.....	800	Mosler, A. R., & Co.....	786	V	
F		Moss Photo Engraving Co.....	788	Velie Motor Vehicle Co.....	798
Faries Mfg. Co.....	800	Motor Car Equipment Co.....	787	W	
Federal Rubber Mfg. Co.....	735	Mott Wheel Works.....	804	Warner Gear Co.....	742
Fedders Mfg. Co.....	796	Motz Tire & Rubber Co.....	786	Warner Instrument Co.....	797
F. I. A. T.....	746	N		Weed Chain Tire Grip Co.....	787
Firestone Tire & Rubber Co.....	803	National Motor Vehicle Co.....	798	Western Motor Co.....	804
Fisk Rubber Co.....	732	New Process Rawhide Co.....	795	Wetherill Finished Castings Co.....	804
Ford Motor Co.....	801	Nordyke & Marmon.....	801	Whitney Mfg. Co.....	793
G		Not-A-Crank Gas Engine Starter Co.,	744-45	Willard Storage Battery.....	739
Goodyear Tire & Rubber Co.....	786	O		Willys-Garford Sales Co.....	B. C.
Gray & Davis.....	803	Oakland Motor Car Co.....	801	Willys-Overland Co.....	748
Grossman, Emil, Co.....	796	Owen, R. M., & Co.....	786	Winton Motor Car Co.....	783

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TIMES SQUARE AUTOMOBILE COMPANY
North-East Corner Broadway and 54th Street
NEW YORK CITY

THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 8

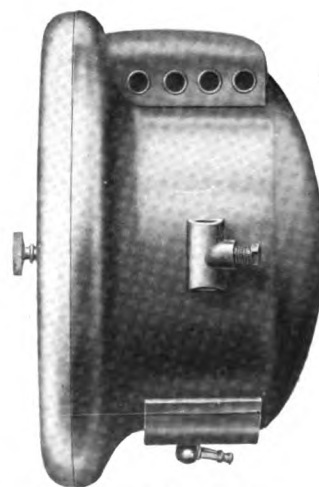
New York, February 15, 1912

Ten cents a copy
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Solar Lamps Stand the Test of Time

Solar Lamps have been shining examples of Motor Lamp Excellency for over 14 years.

Their success has been based on a quality probably equalled by no other motor lamps in existence.



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Lasting Satisfaction

As evidence of this quality, Solar Lamps are to be found on more high grade cars than all other makes combined.

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The men whom experience has taught to discriminate between things that are and things that seem to be investigate Solar Lamps—and then they buy them.

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The Badger Brass Manufacturing Co.

Kenosha, Wisconsin

New York City



*Tire-by
Satisfied
thank you*



The amount of service a tire gives is directly proportionate to the amount of strength built into it.

There can be no argument about that. The same is true of the engine, the caburetor, or the magneto.

And to select the strongest tire on the market is no longer a difficult task. It is merely a matter of selecting the maker who has the most thoro knowledge and the best facilities for putting strength into his tires.

Suppose the four leading shoe manufacturers of the country should unite to produce one line of shoes.

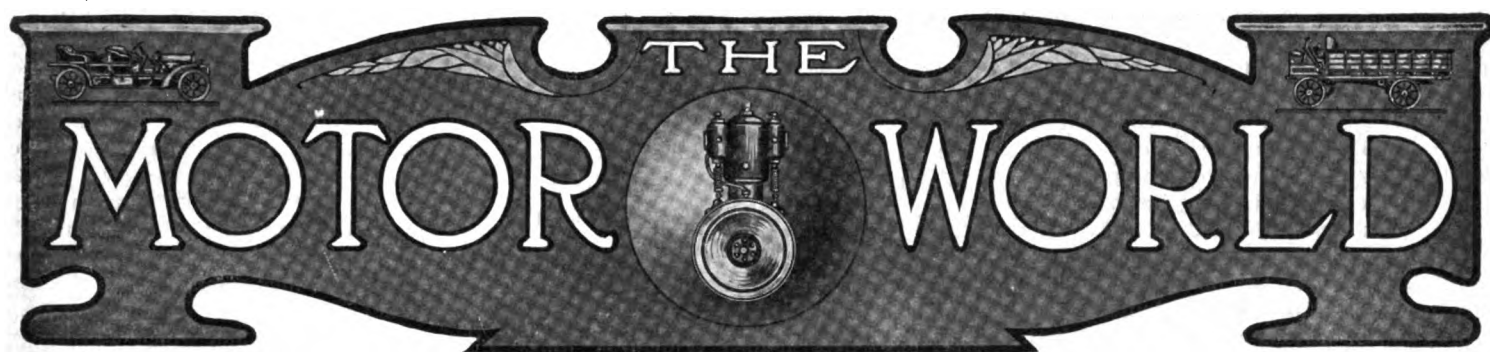
Suppose one maker had worked out and controlled a series of machines that were an improvement over those used by other makers—another had devised a method of construction that was a distinct advance over all his competitors. The other two makers likewise possessed manufacturing secrets that had for years back distinguished their particular brands.

Would not the product of the combined knowledge and facilities of these four makers, to your mind, be a shoe of better quality and design than if made with the limited experience and facilities of any single maker?

There is only one answer possible.

Precisely this same condition exists today in the automobile tire industry.

UNITED STATES TIRE COMPANY
New York



DICKERING FOR FOUR-WHEEL DRIVE

General Electric Co. Seeks to Acquire Control of Church System—Chief Patent and the Parties Involved.

If negotiations which now are pending between the General Electric Co. and M. B. Church are brought to consummation, it is probable that the four-wheel drive will play a much more conspicuous part in the automobile industry than at present is the case.

Church holds the controlling interest in the Church Balance Gear Co., of Grand Rapids, Mich., which in turn controls the patents covering the Church or Couple-Gear system, and is the chief figure in the case, but it is believed that the other stockholders will be brought to see the advantages which the transaction will place within their grasp. Still another party to the deal is the Couple-Gear Freight Wheel Co., of Grand Rapids, which holds an exclusive license from the Church Balance Gear Co., to produce commercial motor vehicles under the patents involved, of which there are six.

The attitude of the Couple-Gear Freight Wheel Co. has not been made wholly plain, but that the negotiations have been in progress for a considerable period, and that they still are pending, is beyond doubt. That the General Electric Co. aims to acquire or control the patents in their entirety is almost equally certain, its manufactures and ramifications extending in so many different directions that the patents can be applied not merely to its commercial vehicles, which are produced by the General Vehicle Co., in Long Island City, N. Y., but to many other of its varied productions.

Of the six patents involved, the chief is No. 856,943, issued June 11, 1907, to M. B. Church and Karsten Knudsen, which covers what is known as the "evener," or "equalizer," which works on the differential principle, and which really is the key

to the entire Church four-wheel drive system.

While the drive is best known because of its application to Couple-Gear trucks and tractors, it is susceptible of many other uses and in a small way has been applied to the driving of machine tools, elevator hoists, windmills, ceiling fans, and similar apparatus.

Chalfant Out of Automobile Industry.

E. P. Chalfant, who became president of the E. R. Thomas Motor Car Co., of Buffalo, at the time of its re-organization about a year ago and since has placed it on its feet, has resigned that office and yesterday retired from active participation in the company's affairs, and from the automobile business with which he had been connected almost from its inception. He will remain a stockholder, but henceforth will be associated with Harrison Williams, in New York, in the financing and supervision of the public utility companies. Among other things, Chalfant will become president of the Springfield (Mo.) Railway and Light Co., and of the Sharon and New Castle (Pa.) Railway Co., and a director of the Youngstown-Sharon Railway & Light Co. He will also be director of sales and securities for Harrison Williams, who several years ago was identified with the automobile industry at which time he and Chalfant were closely associated.

Fishbach Angling For a Factory Site.

The Fishbach Motor Co., of Newark, N. J., which recently was incorporated with \$3,000,000 capital stock, is seeking a factory site and is flirting with Youngstown, O., among other places. Its communication, which is signed by R. R. Galligan, secretary of the company, states that it proposes manufacturing a line of low-priced cars and wagons, that it will require about six acres to accommodate its immediate needs, and that it is prepared to break ground about June 1st. The most remarkable part of the communication is the declaration that the company is prepared to deposit \$300,000 in any local bank as a guarantee of good faith,

JONESES SEEK TO SAVE JONZ CAR

They Secure Receiver to Halt Clamoring Stockholders—Aftermath of "Clink of Gold" Stock-Selling Campaign.

By the appointment of a receiver for the American Automobile Manufacturing Co., of New Albany, Ind., a semicolon, if not a full stop, was put to a concern which conducted the most florid and grandiloquent stock-selling campaign which ever was attempted in the automobile industry.

The receiver, the New Albany Trust Co., was appointed on the petition of Chester C., Carey C. and Ellsworth Jones, all of whom are stockholders in the company, who allege that while the assets amount to \$200,000 and liabilities to \$49,000, the company is suffering from lack of working capital, and declare that a receiver is necessary in order to protect their interests and the interests of others against suits which are being instituted by other stockholders, of whom, the petition states, there are nine thousand residing in all parts of the United States. Of the liabilities, it is stated that \$9,000 are represented by open accounts and \$16,000 by notes. It is also admitted that the plant in New Albany is bonded for \$24,000.

The American Automobile Manufacturing Co. is the outgrowth of the Jonz Automobile Co. which, in a small way, operated in Beatrice, Neb., and which produced a few two-cycle, air-cooled cars which attracted the attention of Berton B. Bales, of Louisville, Ky., and certain of his associates. They reached out and formed a connection with the inventor, C. Charles Jones, whose name as applied to the car was corrupted to Jonz, and about a year ago removed the Nebraska machinery to New Albany, which is directly across the river from Louisville, and formed the American Automobile Manufacturing Co., with \$1,000,000 in capital stock, divided into two hundred thousand shares of \$5 each. An old cotton mill in New Albany was se-

cured for manufacturing purposes, but the business office was maintained in Louisville, and to all appearances the business office was more industrious than the factory, and a good share of the capital was expended in the effort to sell stock.

The prospectus issued was one of the most elaborate and most extravagant that ever has seen the light. Among other things it contained the portraits of everyone connected with the company, from the president almost to the office boy. There were pictures of the factory buildings, of course, and of various corners of the plant, all of which were printed on heavily enameled paper. While the portraits of at least some of the officials were handsome to look upon, the letterpress of the book was its chief charm; it was a masterpiece of word-juggling. It so magnificently described "the clink of gold" with which the automobile industry was associated that the clink almost could be heard. It spoke blithely and superbly of dividends of from 60 to 1,000 per cent. annually, which it was alleged had been earned by some of the men in some of the companies engaged in the business of automobile manufacture, which it declared was merely "in its infancy." As proof, it pointed to the tens of millions of horses and mules which yet remained to be displaced by motor cars; in fact and in whole it was a gloriously enticing bit of literature, and it is not altogether strange that it extracted money from nine thousand persons in all parts of the United States, who were anxious to join the "golden heads" and "taste of this prodigiously lavish banquet of fortune," to quote its prospectus.

Despite the fine frenzy of the prospectus, which declared that the company's plant and equipment had been appraised at \$250,000, and that the factory which just had been transferred from the Nebraska prairies was "already \$450,000 behind in its orders," the American Automobile Manufacturing Co. was slow in acquiring momentum. The grand, gorgeous and glorious promises were as slow in materializing, so slow indeed that in September last Bales retired as president of the company and was succeeded by George H. Wilson. There were those who accepted the change as indicative of a state of affairs not so thoroughly happy as not to at least faintly foreshadow the receivership proceedings which have just been instituted against the company.

Klaxon Sues Motor Car Manufacturer.

Striking out in a new direction in its campaign to prevent infringement of the Klaxon patents, the Lovell-McConnell Manufacturing Co., of Newark, N. J., last week instituted suit in the federal court in Indianapolis against the Simplex Motor Car Co., of Mishawaka, Ind., manufacturer of the Amplex car. The alleged infringement complained of consists of the use of Newton horns on Amplex cars.

A. M. A. A. PROVES LEGALLY ALIVE

Sues Vice-President for Year's Dues and Obtains Judgment—Unlooked-for Chapter in Trade History.

Although to all intents and purposes the Automobile Manufacturers Association of America is chiefly a memory, that it still retains legal existence is indicated by the fact that last week it obtained judgment in the New York City Court for \$250, with interest and costs, against William S. Jones, who at the time of its organization, on June 6, 1911, was elected first vice-president of the association.

According to the papers in the case Jones, who represented the Otto Motor Sales Co., enrolled as a charter member which required that he pay the admission and membership fee of \$250, which remained in vogue for a period of 60 days, when the amount was increased to \$500. Whether Jones repented of having joined the association, or whether he dismissed it from further consideration, does not appear, but at any rate he failed to pay the \$250, and as he entered no defense to the suit judgment was taken for \$270.26.

The Automobile Manufacturers Association of America, as may be recalled, grew out of the so-called independent show which was held in Grand Central Palace in New York in January, 1911, and, like the show itself, was due to the efforts of the publishers of an up-State carriage trade journal who sought to make a place for themselves in the automobile industry. It was promised that the association would do many things but this suit against its one-time first vice-president is the most aggressive evidence of activity which it ever performed. It opened an office on Fifth avenue, New York City, and one of the carriage trade publishers figured as its manager, but the office was silently closed and until the judgment against Jones was entered it was supposed that the A. M. A. A. was dead beyond recall.

Arrest Follows Bankruptcy Proceedings.

Charles H. Walters, vice-president of the De Tamble Motors Co., of Anderson, Ind., and previously vice-president and general manager of the Mansfield Rubber Co., of Mansfield, O., was placed under arrest on Thursday last, 8th inst., on charges growing out of the bankruptcy of the rubber company, and later released under \$10,000 bail. At the time that the bankruptcy proceedings were instituted, and while they were threatening, it was stated that Walters and certain officers of the company had been guilty of criminal acts, and while arrests were talked of the fact that none were made led to the belief that most of the trouble had blown over. Walters's ar-

rest therefore was not generally expected. Walters is charged with grand larceny and embezzlement, the specific indictment on which he was arrested alleging embezzlement of \$16,654, but it is understood that the total amount involved approximates \$200,000. Among other things he is accused of appropriating to his own use 24 gold bonds valued at \$12,000 and issued by the De Tamble company to the Mansfield Rubber Co.; a stock certificate for \$3,340 issued by the rubber company, also the sum of \$1,314.83 in cash which he collected from the motor company, and which was due to B. L. Chase, president of the rubber company, and which he refused to turn over to Chase.

Their Wives Now Swear Off Liabilities.

Sarah Morris and Hannah Grinberg, who are respectively the wives of Adolf Morris and David Grinberg, who comprised the bankrupt and always odoriferous Manhattan Storage Co., of New York, have filed petition in bankruptcy asking that they be relieved from responsibility for debts incurred in indorsing notes to assist their respective husbands. Mrs. Morris's liabilities amount to \$10,522 and Mrs. Grinberg's to \$9,848. The latter's debts include notes which she endorsed for the Hayes Rubber Co., of which her husband was president, and which also is bankrupt. Both ladies make oath that they are possessed of no assets. Their largest creditor is the Continental Rubber Works, of Erie, Pa., whose claim amounts to \$7,392.

Humpage Assumes Thomas Presidency.

F. R. Humpage has been elected president of the E. R. Thomas Motor Car Co., of Buffalo, N. Y., to succeed E. P. Chalfant, who relinquishes the office today and retires from the automobile industry. Humpage, like Chalfant, joined the Thomas company at the time of its reorganization a year ago, at which time he was elected vice-president and general manager. The vacancy caused by his elevation has been filled by the promotion of W. L. Gleason, factory manager, to the post of vice-president. J. J. Ramsey remains treasurer.

Case Shares Listed on New York Curb.

Following the purchase by a syndicate headed by J. P. Morgan & Co., of \$8,000,000 of the J. I. Case Threshing Machine Company's increased capital stock, the shares have been listed on the New York curb market. They are held at about 100½. It is stated that it is the first time that the Morgan firm had ever applied to have any of its holdings listed on the curb market.

Making Spark Plugs in West Virginia.

The Steenrod Auto Supply Co., which recently established itself in Wheeling, W. Va., has undertaken the manufacture of spark plugs. George Steenrod is the moving spirit in the venture.

"COLLEGE-BRED" CAR IN TROUBLE

Washington Company With "College" Annex Claimed Hopelessly Insolvent—Students Worked Without Pay.

After a struggle extending over a period of seven or eight years, during which shadows and sunshine have chased each other, the Carter Motor Car Corporation, of Washington, D. C., finally is in the hands of receivers. They are Wilton J. Lambert and A. Gary Carter, the latter of whom is the head and most of the front of the embarrassed corporation. They were appointed as a result of a petition to foreclose under a deed of trust filed by E. A. Bowers, trustee, and George B. Davenport, holder of promissory notes amounting to \$50,000, which petition alleges that the corporation is hopelessly insolvent, and that the securities therefore are in such danger under the terms of the deed of trust that foreclosure is necessary as a means of safeguarding them.

The Carter Motor Car Corporation which, while retaining offices in Washington, maintains a factory in Hyattville, Md., which is near to the District of Columbia line, made its initial bid for fame and fortune with a two-engine car which first was exhibited at the Grand Central Palace Show in New York some six years ago, at which time, however, the exhibitors were more keenly interested in selling stock than cars.

The car displayed was fitted with two separate engines, the idea being that when one went wrong the other could be coupled up without delay. This somewhat radical notion, however, did not prevail and of late years the company has built a touring car of conventional type, styled the Washington, and late last Fall they saw so much sunshine ahead that they were figuring on opening a branch store in New York City.

Although the two-engine car was dropped long ago, the Carter Motor Car Corporation has been operating in somewhat unusual fashion, which is to say that its workmen partly or largely have been pupils of the so-called Automobile College of Washington, who rendered labor free of cost. The company and the "college" have been so closely interwoven that it has been difficult to tell where one began and the other ended. Although only about two months ago Howard Carter, who is prominent in the affairs of the company, denied to a Motor World questioner that the Washington Motor Car Corporation was in any way affiliated with the Automobile College of Washington and professed not to know that its letterheads, catalogs and circulars made use of the company's name and photographs of its factory, the advertising matter of the college indicated to the contrary.

The "college," which heralds itself as "The Greatest School of Expert Automobile Engineering in the United States," was a prolific producer of printed matter, in all of which the most was made of the claim that it was "the only school in the country training men in a factory where automobiles are built," and went so far as to offer to appoint each student a sales agent for the Washington car.

Despite his other denials, Carter admitted that the students were permitted to work in the Carter factory and seemed to think it a clever means of effecting economy and obtaining labor free of cost.

Whether "the greatest school of expert automobile engineering in the United States" will be affected by the embarrassment of the Carter Motor Car Corporation is not plain, but it is possible as despite Howard Carter's denial the "college" itself scattered broadcast a circular which plainly states that "we consolidated with the Carter Motor Corporation."

De Tamble Must Return Dealer's Deposit.

Judgment for \$6,302.90 was entered in the New York Supreme Court on Tuesday last, 13th inst., against the De Tamble Motors Co., of Anderson, Ind., in favor of Frederick L. Kopff, of 214 East 57th street, New York, as assignee of Lizzie J. Norton, of Hightstown, N. J. According to the complaint in the case, Mrs. Norton contracted for the exclusive sale of De Tamble cars in Bergen County, N. J., placing an order for 200 cars and making a deposit of \$7,000 with the De Tamble company, to be applied to each car delivered at the rate of \$50 per car. Up to January 16th last, she had sold 15 cars, for which \$750 had been deducted from the deposit. At that time, she alleges that C. H. Walters, vice-president of the company, sought to abrogate the contract and turn over the agency to some one else. As Mrs. Norton would not agree to the proceedings, she charges that Walters deliberately broke the contract when there remained \$6,250 to her credit. Through Kopff she accordingly sued for that amount, which was recovered with interest and costs.

Ask Lower Rates for Speedometers.

Alleging that the transportation rates on speedometers and speedometer equipment are too high, the Stewart & Clark Mfg. Co. has filed a complaint with the Interstate Commerce Commission, charging that these goods are classified on the routes between Chicago and San Francisco, and other Californian points, as "first class." The Interstate Commerce Commission is asked to make "a classification upon speedometer equipment, to include flexible brass tubing, sprockets, clamps and all metal parts and equipment except the speedometer heads of third class." The Atchison, Topeka & Santa Fe and other railroads are named defendants to the complaint.

WHY U. S. MOTOR PASSED DIVIDEND

President Briscoe Explains at Length to Stockholders—Also Hints at "Highly Interesting" Developments.

Why the United States Motor Co. passed its quarterly dividend of 1¼ per cent. last week, as was briefly stated in the Motor World, is explained at some length by President Benjamin Briscoe in a statement issued to the stockholders which is accompanied by a copy of the company's balance sheet showing its condition at the close of its fiscal year, July 31, last.

In the course of his statement Mr. Briscoe, among other things, suggestively remarks that while it is obviously inexpedient to disclose plans for future productions, "the stockholders in the near future may look for developments highly interesting from the standpoints of designing, manufacturing and selling."

Of the conditions that have obtained since the close of the fiscal year, Mr. Briscoe says:

"For the first five months of the fiscal year your company and its manufacturing departments have made a substantial profit, and it is worthy of note that though this period is conceded to be the leanest of the entire automobile season, the profits are greater than those made heretofore during any like period. The accounts payable for merchandise is almost \$1,500,000 less than it was six months ago.

"The number of cars sold during the first five months of the fiscal year was 6,512, as against 4,483 cars sold during the corresponding period of the previous year. This is an increase of 45 per cent. This year the company has contracts with 1,503 dealers, as against 1,043 dealers which sold our goods last year. The number of cars contracted for by this year's dealers is by more than 25 per cent. in excess of the number contracted for in the previous year.

"The facts cited in the foregoing demonstrate that our business has improved and is in better shape than ever before. Notwithstanding this, your directors have deemed it best for the interests of all concerned not to declare a dividend payable at this time. Even under the most favorable circumstances this particular period of the automobile season lends itself least to the paying out of dividends, because at this time it is absolutely necessary to carry large inventories in order to be prepared for the heavy spring selling season. In consequence every single resource of the company must be husbanded now so that the spring rush of business may find us fully in condition to profit by the advantages afforded by timely forethought and ample preparation. In view of the fact that dividends on the preferred stock of the company are cumulative, this action of

your directors must be considered in the light of good judgment and as a sound business measure.

"It is an undeniable fact, however, that the growth of the business also increases its requirements for working capital and that for that reason it is the part of wisdom to conserve the company's cash; in other words, to keep the money in the business, instead of paying it out.

"The question whether it would be good policy or not to declare a preferred stock dividend now has not been decided by the directors without taking into full consideration the interests of the stockholders. We have consulted a number of the largest stockholders who naturally are most vitally interested in the dividend policy of the company on the one hand and in the conservation of the company's ready cash working capital on the other. These stockholders, without exception, have advised that it would not be good policy at this time of the year to withdraw from the treasury of the company the sum of approximately \$200,000 otherwise necessary for this mid-winter dividend. The seasonable nature of the automobile business is so pronounced that it always has been a serious question with your directors whether it would not be better to pay dividends annually, or at the most, semi-annually.

"The annual statement [which is appended and a digest of which was printed in the Motor World at the time it was rendered] shows the condition of the company and of its manufacturing branches, including the operations of its subsidiary selling companies, for the fiscal year, ending July 31, 1911. The statement of the previous year did not take into account the operations of the selling companies; these latter were included in the item 'Securities Owned.' The previous year's statement, therefore, can hardly serve as a standard with which the present statement may be justly compared.

"Price, Waterhouse & Company [the accountants] reduced the selling companies to their actual book values, allowing nothing for their good will and for the expense incident to their establishment.

"The company's working methods have been entirely reshaped. The reorganization has resulted in numerous savings which reach a total of \$300,000 to \$400,000 a year in expense account, as compared with the expenses necessary under the old methods of operation. The operating efficiency, on the other hand, has been greatly increased, and the conditions, in general, are better than they have ever been. The inventories are necessarily larger this year than they will be in subsequent years, because we require the materials to carry through a larger number of models than it will be necessary or advisable for us to produce hereafter. However, the exigencies of consolidating our various companies have made inevitable the bringing out of a

greater number of models than are considered necessary for the future."

The annual balance sheet as rendered is as follows:

ASSETS			
Capital Assets:			
Land, Buildings, Machinery and Equipment	\$ 9,276,126.26		
Securities of Selling Companies	720,000.00		
Patents, Contracts, Trade Names and Good Will	12,321,222.64	\$22,317,348.90	
Deferred Charges:			
Discount and Commission on 6% Gold Bonds, Improvements to Leased Buildings and Prepaid Expenses		1,706,677.58	
Current Assets:			
Inventories	\$ 7,890,073.43		
Investments	135,380.00		
Accounts Receivable	2,992,477.99		
Bills Receivable	1,268,861.39		
Cash	1,305,746.11		
Subscriptions to 6% Gold Bonds, due and received Oct. 2, 1911	2,433,723.01	\$16,026,261.93	
		\$40,050,288.41	
LIABILITIES			
Capital Stock:			
United States Motor Company:			
Preferred:			
Authorized	\$15,000,000.00		
Issued	\$11,647,833.33		
Less—In Treasury	156,700.00		
	\$11,491,133.33		
Common:			
Authorized	\$27,500,000.00		
Issued	\$13,175,850.00		
Less—In Treasury	982,500.00		
	\$12,193,350.00	\$23,684,483.33	
Capital Stock and Surplus of Subsidiary Companies not owned by United States Motor Co.		100,303.17	
6% Serial 5-Year Convertible Gold Bonds, dated October 2, 1911		6,000,000.00	
Deferred Liabilities:			
Purchase Mortgages and Balances Payable on Plants		472,275.85	
Current Liabilities:			
Bills Payable	\$ 4,462,920.21		
Accounts Payable	2,898,212.17		
Customers' Deposits	226,281.31		
Dividend Payable Aug. 10, 1911	201,082.00		
Accrued Interest on Bonds and Loans	103,851.88	7,892,347.57	
Reserves:			
For Depreciation of Plants	\$ 802,217.08		
For Doubtful Accounts and other items	644,912.53	1,447,129.61	
Net Surplus: July 31, 1911		453,748.88	
		\$40,050,288.41	
Profits for all Companies for year ending July 31, 1911, before adjustment of inventories and other items			
		\$ 1,569,265.64	
ADJUSTMENT OF SURPLUS			
Surplus:			
As at July 31, 1910, per last annual report	\$ 2,382,330.59		
Less—Adjustments subsequently made in accordance with report of Price, Waterhouse & Co., dated June 1, 1911	954,010.57		
	\$ 1,428,320.02		
Add—Profits of all Companies for year ending July 31, 1911, before adjustment of inventories and other items	1,569,265.64		
	\$2,997,585.66		
Less—Adjustment to provide for obsolete material and bring book inventories into agreement			

with physical inventories

1,086,669.84

\$1,910,15.82

Deduct:

Interest on Loans (\$718,755.57), Dividends on Preferred Stock (\$738,411.37)

1,457,166.94

Net Surplus July 31, 1911

\$453,748.88

Bankruptcy as Short Cut to Dissolution.

Having recently organized and incorporated the Transportation Sales Co., of New York, Chester Griswold, James L. Breese, Jr., and H. Walter Webb, who comprised the \$200,000 Motors Engineering and Sales Co., at 250 West 54th street, New York, have filed a petition asking that the latter company be declared bankrupt. Griswold figures as a creditor to the extent of \$7,100, while Breese's claim amounts to \$4,050 and Webb's to \$725, all for moneys advanced to the company, which, the petition recites, has admitted in writing its inability to pay its debts. In response to the Motor World's inquiry, Griswold explained the somewhat unusual proceeding by stating that having organized the Transportation Sales Co., and secured a much more liberal charter, it is desired to wind up the Motors Engineering and Sales Co., and as the usual method of dissolution would require about two years, bankruptcy proceedings were resorted to as a much shorter cut. The Transportation Sales Co., as the Motor World stated, was formed to handle in the metropolitan district the Commer truck and the Guy Vaughan car, both of which are the products of Wyckoff, Church & Partridge, Ltd. It has also been decided to sell the deDietrich car.

Steinbock Completes \$1,000,000 Company.

H. E. Steinbock, for many years chief designer of the Maxwell-Briscoe Motor Co., who several months since organized the Steinbock Engineering Co., in Peekskill, N. Y., has formally incorporated the company, under the laws of New Jersey, with \$1,000,000 capital stock. The election of officers served to disclose the identity of Steinbock's associates in the project. E. J. Forham has assumed the presidency of the company, and F. B. Knowlton is secretary-treasurer. Steinbock himself is vice-president. It is stated that the touring car which the company has in hand will be ready for the market early this summer.

Company Formed to Build Truck Bodies.

The Motor Truck Body Co. has been organized in Detroit for the purpose suggested by its title, i. e., the manufacture of bodies for motor trucks and other commercial vehicles. A considerable plant already has been secured at 320-322 Franklin avenue. The officers of the company are Fred Proctor, president; E. T. Haugstefer, secretary and treasurer; and Harry A. Carie, manufacturing manager, all of whom previously were connected with the body department of the Packard Motor Car Co.

OLD TRADESMEN IN NEW PLACES**Appointments, Promotions, Transfers and Resignations Reported from All Parts of the Country.**

D. W. Rudisell has been appointed district manager for the Ohio Motor Car Co.'s Canadian territory. He will make his headquarters in Toronto.

A. A. Crumley has been appointed manager of the branch store which the Marquette Co. just has opened in Detroit. It is located at 1237-41 Woodward avenue.

Philip E. Hawley has been appointed New England manager of the Studebaker Corporation, with headquarters in Boston. Previously he was identified with the business in Detroit.

Gaylord Warner, who for three years has been manager of the E. R. Thomas-Chicago Co., has resigned that office to engage in the railroad business. He has been succeeded by N. B. Hand, the former assistant manager of the branch.

B. D. Arthur who for the past two years has represented the Ohio Motor Car Co. on the Pacific coast, as district manager, has been brought back to the factory in Cincinnati, where he will assume charge of the commercial car department.

C. H. Rockwell, who managed the Franklin branch in Cleveland, has been promoted to the post of district manager for the States of Ohio, Michigan, West Virginia and Western Pennsylvania. He will continue to make his headquarters in Cleveland.

Frank B. Wood, formerly of the Chicago Motor Club, has been appointed general superintendent of the Midland Motor Co.'s factory at East Moline, Ill. A few months ago he was placed in charge temporarily, and the appointment now has been made permanent.

T. J. Toner, who had been representing the Studebaker Corporation's sales department on the show circuit, has been assigned to duty on the Pacific coast, and already has departed for San Francisco. He will have entire supervision of the branches and agencies west of Salt Lake City.

E. M. Lubec has succeeded F. M. Busby as manager of the Chicago branch of the Studebaker Corporation, in which capacity he will place agencies throughout the Middle West. Busby has left the Studebaker company to take up the distribution of Hudson cars in the territory surrounding Chicago.

George W. Franklin, who has covered Regal territory since the Regal Motor Car Co. first was formed, has been promoted to the management of the Regal Motor Sales Co., of Detroit. He will have charge not only of the local business, but will serve as district manager for the entire State of Michigan.

J. P. Patterson has been appointed manager of the Firestone Tire & Rubber Co.'s branch in St. Louis. Previously he was connected with the Firestone depot in Chicago. G. M. Martin, the former manager of the St. Louis branch has been transferred to the management of the Minneapolis establishment.

R. G. Neighbors has been promoted to the post of sales manager of the Hupp Motor Car Co., of Detroit. For the past several months, or since C. D. Hastings was elevated to the general management of the company, Neighbors has practically been in charge of the sales department and, therefore, is not strange to his duties.

Henry L. Johnson who at one time was manager of the G & J Tire Co.'s branch in Boston, but who more recently was connected with the Premier establishment in that city, has been appointed sales manager for the Easton Machine Co., of South Easton, Mass., makers of the Morse car. He will make his headquarters at the Morse branch on Hereford street in Boston.

Charles H. Dalquist has been appointed assistant chief engineer of the Lippard-Stewart Motor Car Co., of Buffalo, N. Y., makers of the Lippard-Stewart truck. Dalquist has had ripe experience, having been identified, respectively, with the Chalmers and Velie companies, and for two years past with the International Harvester Co. as chief engineer of the automobile end of its business.

S. G. Rigdon, superintendent of agencies for the Republic Rubber Co., of Youngstown, O., has resigned that office and established a connection with the Whitmore Manufacturing Co., of Cleveland, which produces the Whitmore gear protective compound. Rigdon will be manager and part owner of a subsidiary company which will be organized for the purpose of selling the Whitmore product to the automobile trade.

J. C. Stiles, who represented the Warner Instrument Co. in Indiana, has been transferred to St. Louis, where he will have charge of the branch which the Warner company just has opened there, and which will take care of the entire Southwest. W. C. Knight, who previously was in charge of the Warner office in Cincinnati, has been transferred to Indianapolis, and will cover the territory previously traveled by Stiles.

Smith "Insiders" Concentrating Shares.

Persons intimately identified with the A. O. Smith Co., of Milwaukee, are seeking to purchase all of the shares of the company held by stockholders not actively engaged in the business and which, it is said, amount to about \$500,000. The present capitalization of the company, \$1,200,000 will remain unchanged. The effort at present in progress has been contemplated for some time, according to L. R. Smith, sec-

retary of the company, and is being made in order to effect a more compact organization. Smith added that this injection does not presage any immediate change in the extent or control of the company, and believes that when the purchase of the stock is completed the working basis of the company will be improved.

Pittsfield Rumors That Are Lacking Truth.

Apparently because of confusion with the Jacobson-Brandow Co., of Pittsfield, Mass., which made magnetos and other ignition devices and which recently went into the hands of a receiver, the Pittsfield Spark Coil Co., of Dalton, Mass., states that it has been considerably embarrassed by reports affecting its solvency. As a matter of fact, the Pittsfield people say there never was a time when they had more orders in hand or when they were in a more prosperous financial condition. The Pittsfield company's factory is being operated at full capacity and the orders booked for the ensuing year are the largest in the company's history.

Woolson's Promise of a Two-Ton Truck.

The Woolson Auto Truck Co., of River-ton, N. J., of which C. T. Woolson is proprietor, has been formed to manufacture a two-ton truck which "will sell for several hundred dollars less than any first-class truck now on the market," to employ Woolson's own words. He expects to have his first truck on the road within thirty days. He has been engaged in the wagon business for many years and for the past five years has handled automobiles also.

Hercules May Secure West Virginia Plant.

The Hercules Tire & Rubber Co., of Pittsburgh, of which George Paul and W. R. Page are the moving spirits, has practically consummated a deal whereby it will become possessed of a disused factory building in Warwood, which is near Wheeling, W. Va. The Wheeling Board of Trade has endorsed the proposition made by the Pittsburgh men, which, it is stated, practically assures that the transaction will be brought to a head.

Lauth-Juergens Secures Branch Factory.

The Lauth-Juergens Motor Car Co., of Fremont, O., finally has consummated arrangements for the establishment of a branch factory in Gibsonburg in the same state, where the residents have subscribed for \$60,000 worth of stock to bring the industry "into their midst." The Lauth-Juergens company also has increased its capital stock and will use the proceeds in enlarging its truck plant in Fremont.

Chicago Store for Argo Electrica.

The Argo Electric Vehicle Co., Saginaw, Mich., has opened a branch in Chicago at 2412-2414 Michigan avenue. There will be displayed there both the Argo coupe and Argo light truck.



Detroit, Mich.—Barber Motor Sales Co., under Michigan laws, with \$6,000 capital; to deal in motor vehicles.

Buffalo, N. Y.—Bison Rubber Co., under New York laws, with \$5,000 capital. Corporators—J. R. Heintz, Carl W. Heintz, Robert B. Barnard.

Chicago, Ill.—Dewey Garage Co., under Illinois laws, with \$3,000 capital. Corporators—Alexander C. Mabee, John A. Martinikus, Thomas B. Brown.

Lynchburg, Va.—Taylor Motor Co., under Virginia laws, with \$25,000 capital; to deal in automobiles. Corporators—R. C. Taylor, H. P. Taylor.

San Jose, Cal.—San Jose Auto Supply Co., under California laws, with \$20,000 capital. Corporators—Allen E. Curtner, J. H. McCollough, H. S. Bridges.

Cleveland, Ohio.—Crawford-Hough Garage Co., under Ohio laws, with \$10,000 capital; to deal in motor vehicles. Corporators—G. R. Collar and others.

Clearfield, Ia.—Clearfield Automobile Co., under Iowa laws, with \$5,000 capital, to deal in automobiles. Corporators—J. V. Wright, A. B. Clewell, H. H. Young.

Jacksonville, Ill.—Jacksonville Motor Club, under Illinois laws; to promote the use of motor vehicles. Corporators—A. M. King, John G. Reynolds, D. E. Kennedy.

Des Moines, Ia.—Central Auto Supply Co., under Iowa laws, with \$10,000 capital; to deal in automobile supplies. Corporators—A. W. Eggersten, A. J. Star, B. M. Starr.

Chicago, Ill.—Cartercar Motor Car, under New Jersey laws, with \$10,000 capital; to deal in motor cars. Corporators—Wm. R. Watson, 112 West Adams St., Chicago, and others.

St. Louis, Mo.—Continental Equipment Co., under Missouri laws, with \$25,000 capital; to deal in automobile supplies. Corporators—John Shuford, Edward J. Ryan, Fred Schmitt.

Chicago, Ill.—Banner Rubber Co., under Missouri laws, with \$400,000 capital; to deal in rubber goods. Corporators—Walter F. Roth, 323 West Jackson Boulevard, Chicago, and others.

Cincinnati, Ohio.—Motor Supply and Tire Co., under Ohio laws, with \$1,000 capital; to deal in automobile supplies. Corporators—Earl C. Gargett, Robert C. Gargett, Robert Holbrook.

Fargo, N. D.—Northwestern Supply Co., under North Dakota laws, with \$10,000 capital; to deal in automobiles and supplies.

Corporators—William McArthur, J. D. Grant, S. L. Sheldon.

Chicago, Ill.—Thermoid Rubber Co., under New Jersey laws, with \$300,000 capital; to deal in rubber goods. Corporators—Elbert C. Ferguson, 69 West Washington street, Chicago, and others.

Byesville, Ohio.—Byesville Motor Co., under Ohio laws, with \$10,000 capital; to manufacture gasoline motors. Corporators—Robert S. Hall, Charles R. Austin, J. A. Pryer, E. M. Sperer, J. Glaser.

Louisville, Ky.—The Puncture-Proof Co., Inc., under Kentucky laws, with \$350,000 capital; to manufacture automobile and motorcycle tires. Corporators—William M. Sale, Hill Spalding, Harry B. Fitch.

Cincinnati, Ohio.—Imperial Auto Sales Co., under Ohio laws, with \$10,000 capital; to deal in automobiles. Corporators—Rowland W. Hyel, Wm. W. White, Alfred J. Fiorini, R. F. Meyers, T. E. Kerseetter.

Quincy, Ill.—Gem City Auto Exchange, under Illinois laws, with \$2,500 capital; to manufacture, repair and deal in automobiles. Corporators—J. W. Myers, H. M. Sheer, E. V. Skinner, C. W. Bronson.

Philadelphia, Pa.—Marquette Co., under New Jersey laws, with \$10,000 capital; to deal in automobiles and accessories. Corporators—William R. Watson, 112 West Adams street, Chicago, Ill., and others.

Mason, Ohio.—John Kohl Carriage and Automobile Co., under Ohio laws, with \$10,000 capital; to deal in vehicles. Corporators—John Kohl, George Kohl, Albert H. Bennett, George A. Momen, Frank Ward.

Cincinnati, Ohio.—Motor Truck Express Co., under Ohio laws, with \$40,000 capital; to do a general delivery business. Corporators—Harry J. Janson, J. W. Marx, E. W. White, W. H. Greenland, Guy W. Mallon.

Cleveland, Ohio.—City Auto Livery Co., under Ohio laws, with \$5,000 capital; to deal in automobile supplies and livery. Corporators—George B. Harris, E. E. Rodd, Editha A. Close, S. M. Davis, F. J. Kilrain.

Cleveland, Ohio.—Co-operative Garage Co., under Ohio laws, with \$4,000 capital; to do a general garage business. Corporators—M. L. Sampliner, William St. Clair, R. E. Jarman, A. F. Seelbach, L. H. Mertens.

Brooklyn, Pa.—Fishback Motor Co., under Pennsylvania laws, with \$3,000,000 capital; to manufacture motors. Corporators—J. J. Wittenberg, Brooklyn; P. R. Galligan, New York City; J. W. Ebbs, Englewood, N. J.

Syracuse, N. Y.—Syracuse Auto Supply Co., under New York laws, with \$25,000

capital; to manufacture and deal in motors, motor vehicles and supplies. Corporators—B. R. Newhall, C. A. Benjamin, M. C. Klock.

Chattanooga, Tenn.—Nyberg Auto Works, under Tennessee laws, with \$150,000 capital; to deal in and repair automobiles. Corporators—Henry Nyberg, Z. C. Patten, Jr., O. E. James, J. P. Winn, G. H. Miller.

St. Louis, Mo.—Universal Motor Truck and Traction Engine Co., under Missouri laws, with \$250,000 capital; to deal in automobiles and traction engines. Corporators—William H. Taylor, John Beltram, A. R. Shaffer.

Martinsburg, W. Va.—Safe Auto Tire Co., under West Virginia laws, with \$125,000 capital. Corporators—J. W. Scott, Pittsburgh, Pa.; G. W. Buxton, E. S. Bottomly, W. C. Kilmer, S. W. Walker, of Martinsburg.

Wallington, N. J.—Braender Rubber Co., under New Jersey laws, with \$250,000 capital; to manufacture automobile tires, etc. Corporators—P. Braender, White Plains, N. Y.; F. L. Braender, Passaic; W. P. Braender, Rutherford.

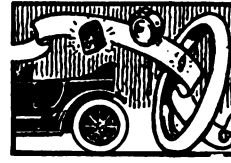
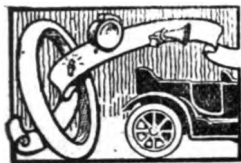
Dallas, Texas.—Stafford Illuminated Auto Lamp and Number Co., under Texas laws, with \$25,000 capital; to manufacture a combination tail lamp and number sign. Corporators—M. M. Parkers, F. W. Schaub, Felix Greenwood, and others.

Cincinnati, Ohio.—D. M. Cooper Co., under Ohio laws, with \$10,000 capital; to deal in automobile accessories. Corporators—H. L. Hagerman, Charles E. Dornette, William H. Mitchell, W. E. Kampfmüller, George A. Dornette.

Morgantown, Ohio.—Maxim Tricar Mfg. Co., under Ohio laws, with \$50,000 capital; to manufacture and sell motor vehicles. Corporators—Harry R. Warfield, Joe K. Buchanan, John L. D. Streater, H. B. Long, A. A. Hall.

New York, N. Y.—Columbia Garage Co., under New York laws, with \$1,000 capital; to do a general garage business. Corporators—Harry S. Lyon, 333 West 96th street; B. G. Bogardus, 150 Nassau street; George Smith Aufrecht, 333 West 96th street, New York City.

New York—Apperson Motor Car Co., under New York laws, with \$10,000 capital; to manufacture and sell motor engines, motor vehicles, etc. Corporators—Henry H. Cannon, Marle Cannon, 54 West 54th street; Mary E. Grasmuck, Tenafly, N. J.; Frederick A. and Marion C. Grasmuck, 34 Convent avenue.



E. E. Peck is building a garage and repair shop in Calexico, Cal.

Froberg Brothers have purchased the garage of A. C. Wade, in Alvin, Texas.

Chris Schill has opened a salesroom in Moorhead, Minn.; he will handle Ford cars.

John D. Bloomhardt, a horsedealer of Altoona, Pa., is remodeling his stables into a garage.

Edward L. Hynson has opened an accessories store on North Walnut street, Milford, Del.

Ellison Simmons and Monte Wilson have established a garage and repair shop in Adrian, Mich.

Bell & Mahaffey is the style of a new firm which has opened a garage and salesroom in Portsmouth, Ohio.

The Automobile & Specialty Works has been organized in Globe, Ariz., and has opened a salesroom on Mesquite street.

John B. Habecker is building a garage and machine shop at 41 South Broad street, Lititz, Pa. It will be ready for business April 1.

Arthur Seeney is building a terra-cotta garage at the corner of Brighton and Sairs avenues, Long Branch, N. J. It will cost, when complete, \$10,000.

The Reliable Auto Repair Co., a new concern of which George Mohler is president, has opened a garage at 174 North Ionia street, Grand Rapids, Mich.

Two new garages are to be opened in Emmetsburg, Pa., in the near future. One will be conducted by the Reid Brothers, the other by Fish & Nelson.

The White Automobile Co. has commenced business at 148 East First South street, Salt Lake City. It is handling the White, R. C. H. and Hupp-Yeats lines.

Albert Jeffers, of Ouray, Col., has removed to Salt Lake City, Utah, and established himself in the automobile business at 43 State street. He has the agency for the Overland line.

Albert G. Hamer, who conducted a machine shop at North Adams, Mass., has sold his equipment and goodwill to the Tower Motor Co., of the same city, and entered the employ of that company.

W. A. Curtiss, who conducted a garage in Lawrence, Kans., has formed a partnership with C. H. Daugherty under the style Curtiss & Daugherty, and is remodeling the big Donnelly barn into a garage.

A \$40,000 garage at present is in course of construction at Twenty-sixth avenue and Farnam street, Omaha, Neb. The building will be three stories in height and

will be occupied by the Drummond Motor Co.

Charles Walton, Jr., who operates the Kenderton Garage at the corner of Tioga and Eighteenth streets, Philadelphia, Pa., has opened salesrooms at 638 North Broad street, where he will show Cutting cars.

The Nolan Auto Co., of Grand Meadow, Minn., has established a branch garage and salesroom in Rochester, Minn., with C. C. Case, of Chatfield, as manager. Chalmers Rambler, Reo and Overland cars will be shown.

Osler & Mathews are the partners in a new firm which has opened a garage in Pomona, Cal., located on South Thomas street, and will do business under the style Opera Garage. They have the agency for Cadillac cars.

E. R. Burkhardt, of Jefferson, Mo., has purchased part of the business of the McCool-Mercer Motor Co., of Oklahoma City, Okla., comprising the Chalmers and Stearns agencies. M. F. McCool will continue to handle Mercer cars.

Henry Maag and B. F. Brown have formed the Clifton Automobile Co. and are preparing to erect a garage at 132 Third street, Union Hill, N. J. The structure will be of concrete, brick and steel construction, 50 x 100 feet and one story high.

The Missouri Motor Car Co., which handles Marnion and Amplex cars in St. Louis, has leased a two-story building at 3007 Locust street, which is at present in course of construction. The structure will be two stories high and will cost \$25,000.

The Elmore Motor Car Co., of Los Angeles, Cal., has changed its name to Smith Bros. Motor Co., the ownership, however, remaining the same. The change is due to the fact that the Smith brothers recently secured the Stearns-Knight agency.

Delon Brothers, who for several years have conducted an agricultural implement business in Kokomo, Ind., have added automobiles to their stock-in-trade. They will sell E-M-F, Flanders and Overland cars at their show rooms at 211 West Sycamore street.

The Southwest Auto Co., which was organized a short time ago in El Paso, Tex., has opened offices at 407 Caples building and will handle the Knox, Maxwell, National, Ohio, Austin, Great Western, New Parry, Havers, Premier and Pullman pleasure cars, and Knox, White and Ohio commercial vehicles. Its territory covers New Mexico, Arizona and parts of Texas and California.

M. Metzger, who owned a farm near Circleville, Ohio, has found farming too slow

and gone into the automobile business. Selling his farm he leased the property at the corner of Main and Pickaway streets, Chillicothe, Ohio, and at present is building a garage and repair shop thereon.

The Locomobile Co. of America has taken over the business of its Baltimore (Md.) agents, Callahan & Atkinson, and hereafter will conduct the establishment as a factory branch. It will be managed by T. W. Wilson, Jr., but both Callahan and Atkinson will remain connected with the branch.

Pursuing its policy of discontinuing factory branches, the Franklin Automobile Co., of Syracuse, N. Y., has disposed of its St. Louis (Mo.) branch to the newly organized Franklin Auto & Supply Co., with salesrooms at 1521 North Grand avenue. Joseph B. Dryer is the active head of the new business.

George A. Barr, of Taft, Cal., has purchased the interest of his partner, D. R. McClary, in the Taft Vulcanizing Works, and will continue the business alone. He is building a garage and a salesroom to be used in connection with the vulcanizing shop, and will operate under the style Taft Garage & Vulcanizing Works.

When The Motor Shop, of Indianapolis, Ind., took over the branch formerly operated by the Fisher-Gibson Co., at 238 Massachusetts avenue, the location of the old Gibson Auto Co., reports made it appear as if the entire business of the Fisher-Gibson Co. had changed hands. As a matter of fact, the Fisher-Gibson Co. continues its business at 416-424 North Capitol avenue, where it has been located since the consolidation of the Fisher Auto Co. and the Gibson Auto Co., last September.

Recent Losses by Fire.

Marinette, Wis.—Heim Carriage Works and seven automobiles destroyed. Loss, \$30,000.

Springfield, Mass.—Krit Motor Sales Co.'s building and fifteen automobiles destroyed.

Meriden, Conn.—Engelhardt's Auto Station wrecked. Caused by explosion of acetylene welding machine.

Murphysboro, Ill.—Murphysboro Automobile Co.'s garage and eleven automobiles destroyed. Loss, \$40,000.

Providence, R. I.—William Fletcher's garage, 638 Broadway, and two automobiles and one motorcycle burned.

Springfield, Mass.—Auto Metal Co.'s building destroyed by explosion of gasoline; several automobiles and valuable machinery burned. Loss, \$50,000.

TOOLS ARE NOT "TRAVELING SETS"

Customs Court of Appeal Upholds Board of Appraisers in Decision—First Automobile Ruling by New Tribunal.

That leather tool cases, such as are used by automobilists, are not traveling sets in the sense of Section 452 of the tariff, but that they must be considered as "articles wholly or in part of metal" (Sec. 199 of the tariff act) is the decision of Judge DeVries of the United States Court of Customs Appeals in the Appeal of the United States vs. Ovington Brothers & Co., of New York, which is the first automobile case decided by that recently created tribunal. When the tool sets were imported, the appraiser classified them under Sec. 452 and held them liable to 50 per cent. ad valorem duty. On protest by the importers the Board of General Appraisers reversed the action of the Collector of the Port and his appraiser and decided that the sets should properly be considered as belonging to Sec. 199, and dutiable at a lower rate. The United States filed an appeal against this decision of the Board, and it is this appeal which called forth the opinion of Judge DeVries, which sustained the Board and which here follows in full:

This is an appeal from a decision of the Board of General Appraisers reversing the action of the collector at the port of New York assessing duty upon what the appraiser thereat returned as "cases fitted with assortments of tools arranged for the use of automobilists and travelers."

The cases in question were composed wholly of leather, and described by the official examiner as "traveling tool goods, consisting of a case made wholly of russet leather, sometimes made of two and sometimes of four parts, from four to five inches long and three to four inches wide, and about one inch thick, and made of convenient size to slip into the pocket."

The cases were fitted with an assortment of tools, consisting of a screw driver, saw, file, and other small blades, for which one handle was provided of such size and construction that the different tools could be fitted into the handle like the blades of a pocketknife.

The handles, with the accompanying tools, were fitted into the leather cases, and both the handles and attached tools, or implements attached, were imported together as a single article. It is conceded that they were intended for the use of automobilists.

The collector at the port of New York assessed duty upon these articles at the rate of 50 per centum ad valorem under paragraph 452, hereinafter quoted. The Board of General Appraisers reversed the decision of the collector, and held the merchandise dutiable as "articles wholly or in part of metal" under the provisions of paragraph 199 of the tariff set of 1909.

It is contended by the Government that paragraph 452 of the tariff act of 1909 is the applicable one. The paragraph reads:

"452. Bags, baskets, belts, satchels, card cases, pocketbooks, jewel boxes, portfolios, and other boxes and cases, made wholly of or in chief value of

leather, not jewelry, and manufactures of leather, or of which leather is the component material of chief value, not specially provided for in this section, forty per centum ad valorem; any of the foregoing permanently fitted and furnished with traveling bottle, drinking, dining or luncheon and similar sets, fifty per centum ad valorem."

The examiner of merchandise at that port testified that in his judgment metal was the component material of chief value in the article as imported.

The crucial point in this case, upon which decision must turn, is whether, or not, the imported article may properly be said to be "a case permanently fitted and furnished with a traveling bottle, drinking, dining or luncheon or similar set," within purview of the last provision of paragraph 452.

It is contended by counsel for the importer that this wallet form of leather is not a "case" ejusdem generis with the enumerated cases, boxes, baskets, etc., in the first portion of said paragraph. We think that this is a closer question than the former, and in our view of the former unnecessary of decision.

A set of automobilists' tools, which are to be used in the every day use of that machine, does not commend itself to the court as within the limiting language of the last portion of the paragraph. It seems to us that that language is intended to cover only that class of articles the more common use of which is confined to extended or journeys of travel, rather than to every day use. The enumerated classes within the provision are of that kind only. This article is intended for occasional and exceptional use. It is an emergency outfit, used and intended to be used whenever there is necessity therefor outside or possibly inside of the garage or away from similar tools. We think this article more an emergency than a traveling set.

It does not strike us as within the common acceptance of the term "travel" that the word is expressive or descriptive of the every day business or even pleasure journeys of the automobilist in or about the business errands or the social intercourse of the day.

We think the decision of the board was correct, and find no reason for disturbing its findings.

Church-Field Secures Detroit Salesrooms.

The Church-Field Motor Co., of Sibley, Mich., which is 11 miles distant from Detroit, has leased the building at 343-346 Jefferson avenue in the latter city, now occupied by the Weeds Electric Garage and will operate the establishment as a general garage for electrics, and as the Detroit salesrooms for the Church-Field car, which is the most revolutionary electric which has been placed on the market in a considerable period of time. The establishment will be managed by R. M. Jones, who previously was connected with the Woods garage.

Indianapolis Trying to Hold Prest-O-Lite.

In the effort to prevent the removal of the Prest-O-Lite Co.'s plant an ordinance has been introduced into the Indianapolis city council permitting the company to maintain its charging plant within the city limits, providing only that it be not situated within 200 feet of any other build-

ing, or of any highway. Certain of the city authorities believe that this distance is not sufficiently great to assure safety, and while a deadlock has not yet resulted it is evident that a compromise will be necessary before the ordinance is passed.

Croxton Company Chooses Officers.

At the annual meeting of the Croxton Motor Co., of Cleveland, in that city, last week, J. P. Stoltz, who, with H. D. Michaels, of New York, and H. A. Croxton, of Cleveland, bought the plant of the bankrupt Croxton-Keeton Motor Co., was elected president. The other officers chosen are: Charles Stevens, vice-president; O. A. Peters, secretary, and I. Zimmer, treasurer. The board of directors comprises J. P. Stoltz, John Stoltz, O. A. Peters, Charles Stevens and Charles S. Patterson.

Cunninghams to Build in Chicago.

James Cunningham, Son & Co., of Rochester, N. Y., who already maintain a branch in Chicago, have purchased a site at 2341-43 Michigan boulevard, in that city, and have let contracts for the erection of a structure which will cost \$100,000. The building will be large enough to include not only sales room, garage and repair departments, but also warehouse facilities which will permit a large stock of Cunningham cars and parts to be kept constantly within reach.

New Yorker Bids For the P. H. P. Truck.

Negotiations practically have been completed whereby the P. H. P. Motor Truck Co., of Westfield, Mass., will be taken over by the Atlantic Motor Truck Co., of New York, of which M. J. Macgill is president, and which is located at 1480 Broadway. The P. H. P. Motor Truck Co. is the outgrowth of the garage business of A. B. Pendleton & Son, who designed the truck and built a few of them for the market.

Detroit Truck Man Seeks Ohio Capital.

If the residents of the east end of Akron, O., raise the sum required, the Ideal Commercial car Co., of Detroit, will locate in that city and increase its capital to \$200,000. D. C. Creighton, general manager of the Ideal concern, has spent some time in Akron furthering the transaction.

Two More Tire Branches in St. Paul.

The Diamond Rubber Co. and the Goodyear Tire & Rubber Co. are this week both opening branches in St. Paul, Minn. The Diamond branch, in charge of B. F. Nickerson, will be located at 126 West Sixth street, and the Goodyear branch, in charge of A. A. Phillips, at 149 West Sixth street.

Monitor Moves Sales Office to Chicago.

The Monitor Automobile Works, of Janesville, Wis., which manufactures the Monitor truck, has removed its general sales office to Chicago, where it will be located at 1421 Michigan avenue. It will be in charge of J. C. Norling, secretary and treasurer of the company.



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ENGINE STARTERS AND PREVENTABLE ACCIDENTS.

Although the motor starter, the development of which has been the most conspicuous feature of motor car improvement during the last year, was designed solely as a substitute for the starting crank and human muscle, it is more than likely to prove to be something more than a device for mechanically lightening the "white man's burden." As an effective and almost infallible preventative of certain classes of accidents its benefits still are to be sung. For in truth the motor starter is the best preventative that has been devised for preventing accidents from "back kicks" and from the starting of the engine while the gears are in mesh and the clutch engaged.

Ever since men began cranking motors they have been "forgetting" to retard the ignition, and the resulting personal injuries have run all the way from sprained wrists to fractured skulls and even death. There are more or less ingenious devices interconnecting the starting crank and the ignition regulating mechanism so as to prevent such accidents; but for the most part these are dispensed with and memory relied upon—often with untoward results. Obviously, the elimination of the crank includes the elimination of all possibility of such results.

While the results that follow the "back kick" sometimes are serious and usually are more or less painful, the consequences that follow the starting of the motor while the gears are meshed usually are far more disastrous. All the conditions are favorable for making trouble. Only last week a man who "forgot" was caught and killed by his own car in its forward lunge immediately following cranking with the gears meshed and the clutch

in; the week before a serious fire followed as the result of another case of "forgetfulness" of the same sort; and quite regularly similar cases are recorded. The motor starter is the most effective sort of a safeguard against these accidents, for the motor usually is started from the seat, and even were the gears in mesh no harm would be likely to result, for the driver would be out of harm's way, in the first place, and ninety-nine chances out of a hundred he would notice the state of affairs before setting his engine in motion. Even if the starter was put in operation by reaching over while standing beside the car, the danger would be infinitely less than if standing directly in front. In many cars it would not be difficult to so place the starter control that it could not be reached—or at least, not without great inconvenience—from the ground, and the suggestion is worth considering.

In the meantime, however, tens of thousands of cars are in use and thousands will be built with starting cranks, and hundreds will go into the hands of owners or drivers who occasionally will "forget" either that the spark is advanced or that the gears are in mesh. Therefore there is a wide field for inventors who have practical ideas on the subject of the prevention of the untoward results of lack of memory and the objects to be served make the effort well worth while.

FEDERAL STATISTICS AND AUTOMOBILE EXPORTS.

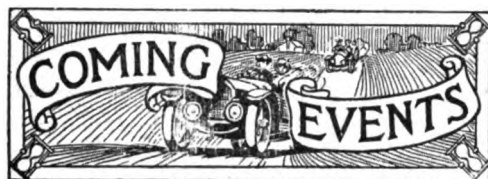
There may be some excuse for the appearance in daily prints of florid statements or assertions questioning the accuracy of government statistics relating to a particular industry, but surely it is not too much to expect that publications apparently devoted to the interests of the industry involved will think twice before conspicuously reproducing such extravagant semi-sensationalisms.

The mere fact that someone in Detroit with a fondness for round figures asserted that the government's totals of automobile exports for the year 1911 were "all wrong," and far too low, was enough, however, for some publications to rush the assertion into print with large headlines. The Detroit doubter evolved out of his head a long string of figures ending in naughts to "prove" that seven Detroit manufacturers themselves exported more cars than were shown by the statistics to have been exported by the entire trade; in at least one instance, the manufacturer was made to say that he alone had shipped abroad fifteen thousand cars, valued at \$9,000,000—a statement which he promptly repudiated when asked by the Motor World if he had been correctly quoted.

As a matter of fact, there is no sound reason for questioning the official figures or for attempting to make our comparatively new-born foreign business appear greater than really is the case. Such efforts prove nothing and serve no purpose, unless it be to afford grounds for laughter abroad.

All who have taken the trouble to follow the statistics are well aware that the growth of our exports which they have disclosed and recorded has been both logical and consistent and in keeping with conditions existing at home. But as invoice prices and not catalog figures govern the Federal officials and the Federal records, and as there is a wide difference between the two prices, there never was a time when any "discoverer" who did not stop to consider the fact could not have found cause for a hollow "scare" similar to the present one.

It must occur to all reasoning persons that the Government can have no object to serve in suppressing figures or undervaluing goods or in any other way lessening the importance of any industry or the extent and value of its foreign trade.



February 10-17, Youngstown, Ohio—Youngstown Automobile Club's annual show in Auditorium rink.

February 10-17, Atlanta, Ga.—Atlanta Automobile and Accessory Dealers' Association's show in Atlanta Auditorium-Armory.

February 12-17, Troy, N. Y.—Troy Automobile Club's annual show.

February 12-17, Ottawa, Can.—Ottawa Valley Motor Car Association's first annual show.

February 12-17, Kansas City, Mo.—Motor Car Trades' Association's show in Convention Hall.

February 12-19, Dayton, Ohio—Dayton Automobile Club's and Automobile Dealers' Association's third annual show in Memorial Hall.

February 14-17, Grand Rapids, Mich.—Third annual show.

February 17-18, New Orleans, La.—Track race, under the auspices of E. A. Moross.

February 17-24, Cleveland, Ohio—Cleveland Automobile Show Company's annual show in Central Armory.

February 17-24, Newark, N. J.—New Jersey Automobile Exhibition Co.'s annual show in First Regiment Armory.

February 17-24, Pittsburgh, Pa.—Pittsburgh Automobile Show Association's annual show in the Exposition Building.

February 17-24, Minneapolis, Minn.—Minneapolis Automobile Show Association's annual display at National Guard Armory and Coliseum.

February 19-24, Hartford, Conn.—Hartford Automobile Dealers' Association's show in the State Armory.

February 19-24, Omaha, Neb.—Omaha Automobile Association's annual show in the Auditorium.

February 19-24, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show of pleasure cars in Music Hall.

February, 20-24, Binghamton, N. Y.—Annual show in the State Armory.

February 20-28, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in Fifth Regiment Armory.

February 21-24, Louisville, Ky.—Louisville Automobile Association's fifth annual show.

February 21-25, New Orleans, La.—New Orleans Automobile Dealers' Association's first annual show in Washington Artillery Hall.

February 21-28, Toronto, Can.—Toronto

Automobile Trade Association's annual show in the Armory.

February 22, Bakersfield, Cal.—Road race under the auspices of the Kern County Auto Racing Association.

February 22-27, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show.

February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.

February 26-28, Charlotte, N. C.—Charlotte Automobile Dealers' Association's first annual show in the Charlotte Auditorium.

February 26-28, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's commercial vehicle show in Music Hall.

February 26-March 2, Paterson, N. J.—Paterson Automobile Trade Association's annual show in Fifth Regiment Armory.

February 26-March 2, Elmira, N. Y.—Elmira Automobile Club's annual show.

February 26-March 3, Cleveland, Ohio.—Cleveland Motor Club's annual show.

February 28-March 2, Davenport, Ia.—Annual automobile show in the Commercial Club building.

March 2-9, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure vehicles only.

March 4-9, Des Moines, Iowa—Des Moines Automobile Club's annual show.

March 4-9, Denver, Colo.—Annual show in Auditorium.

March 12-16, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fourth annual show in the State Armory.

March 13-20, Boston, Mass.—Boston Commercial Vehicle Association's show in Mechanics' Hall.

March 25-30, Indianapolis, Ind.—Indianapolis Automobile Trade Association's first annual show in a tent auditorium covering University Park Square.

April 29-May 4, Burlington, Vt.—Burlington Merchants' Protective Association annual show in State Armory.

man, Reo; second, Eichner, Warren. Time, 5:29½.

Two mile match, W. W. Sargent, Stevens-Duryea, vs. A. E. Noreen, Cole—Won by Sargent. Time, 2:58½.

Twenty-five miles, free-for-all—Won by Waterman, Reo; second, Eichner, Warren; third, Killophy, Imperial. Time, 27:34.

A. C. A. Situation Further Intensified.

The warring factions of the Automobile Club of America continue to war, and according to present indications the battle which is due to be waged on Monday night next, 19th inst., which is the date originally chosen by the president for a special meeting "for the sole purpose of voting upon a proposed radical revision of the constitution and by-laws proposed by a majority of the Board of Governors upon its own initiative," will be one which will not soon be forgotten. Fuel has been added to the flame by the refusal of the president to call a prior special meeting for today (Thursday) for the purpose of discussing the proposed revisions, which will add greatly to the power of the governors. In refusing to call the special meeting, request for which was made by 77 members, instead of the 25 which the constitution requires, the president has signified his intention of merging the two meetings into one. The insurgent members are opposed to this procedure, however, on the ground that "the president's own proxy committee is doing its utmost to control the meeting." Consequently a campaign of literature is being waged, and in a statement issued by the insurgent members, in response to one sent out by 10 members of the Board of Governors, in which they attempted to justify their attitude by quoting the financial condition of the club, it is set forth that though proxies are not approved of, "they must be used by all who are opposed to such revision of by-laws who cannot attend in person." It is urgently requested that those who have given their proxies to the Board of Governors without realizing their significance revoke them and tender proxies to the insurgent faction.

Cobe Again President of Chicago Club.

For the seventh consecutive year, and despite the perennial appearance of "insurgent tickets" just previous to the annual elections, Ira M. Cobe was elected president of the Chicago Automobile Club at the annual meeting of that organization on Thursday last, 8th inst. Although, as usual, an opposition ticket had been nominated, no real contest developed during the election and President Cobe was re-elected by a "walkover" vote. The other officers elected at the meeting were: First vice-president, T. J. Hayman; second vice-president, J. T. Brown; secretary, A. O. Tandy; treasurer, W. D. Morris; directors, T. J. Hay, S. M. Rogers, M. A. Ross, W. F. Bogle, Charles Herendeen and Fred A. Yard.

Waterman Three-Time Winner at Fresno.

Of the four automobile events which were decided at the Fresno (Cal.) combined automobile and aviation meet, on the 4th inst., three were won by Ed Waterman in a Reo. His conquests included a one-mile match race with Ed Eichner, who piloted a Warren, which race was run in 1:16½, from a standing start, and the feature event, a 25 mile free-for-all, which race he finished in 27:34. His victories gave Waterman both the Coliseum and the McCabe cups. Summary:

One mile match, Ed Waterman, Reo, vs. Ed Eichner, Warren—Won by Waterman. Time, 1:16½.

Five miles, free-for-all—Won by Water-

SPRING THAT HOLDS REAL PROMISE

Californian's Invention That Proves Almost a Revelation—Woman Secures Rights and is Forming Eastern Company.

Though the field occupied by vehicle springs and methods of suspension forms a fertile one for inventors, few springs of recent origin have held so much promise as one which is being exploited by Mrs. C. B. Gardner, a bright, business-like woman who is the Sacramento (Cal.) agent for Pullman cars, and who is at present in New York. It is styled the Holloway Equalizing Spring and is the invention of George W. Holloway of Gilroy, Cal., covered by patent No. 1,007,201, issued October 31, last. Mrs. Gardner has obtained the exclusive selling rights for the spring and so sure is she of its genuine merit that she has refused to accept delivery of any cars for her territory unless they are equipped with it.

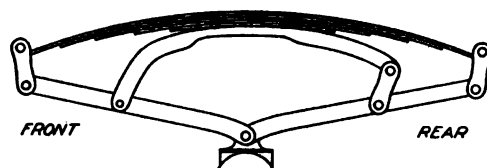
Though there are several sets of the springs in use in California, they have not been formally placed on the market as yet. The first steps toward their manufacture in the East have been taken, however, and it is expected that in about three weeks, or as soon as Mrs. Gardner can visit California and return to New York, a manufacturing company will be launched. In the mean time headquarters have been established in New York City at the Gotham Garage, 102 West 46th street, where a car equipped with the springs is garaged.

In principle, the Holloway spring is quite similar to the ordinary vehicle spring in that its purpose is to absorb the shock to the body of the car caused by the wheels passing over uneven roadway. In the application of the principle, however, it is quite different from anything else of its kind and though it is a radical departure from accepted practice the theory involved is one which is worthy of more than respectful consideration because it actually works in practice. The spring itself is of the leaf variety and is identical with the ordinary leaf spring except that it is inverted, the longest leaf being at the top and the shorter ones between it and the car axle, as is shown by the accompanying illustration. The center of the spring is attached rigidly to the chassis frame and both ends are shackled to long lever arms which attach to the car axle. Between these arms and the spring there is another member which is attached rigidly to the under side of the spring and flexibly to the arms, the front connection being a shackle and the rear connection a pin joint.

The reason for this rather unique system of levers is perhaps best made plain by an explanation of the action of the spring. When the wheel strikes an obstruction in the roadway it is forced upward, the action of the levers being such that the ends of

the spring are pulled downward and therefore toward each other. Consequently there is less tendency to raise the body of the car than there is with the ordinary type of spring which when compressed exerts a direct upward push. In fact the action of the Holloway spring is almost exactly the reverse of the action of the ordinary spring.

Despite the radical nature of the device that it actually serves its purpose in smoothing out the roughest of roads was demonstrated to a Motor World man who accompanied Mrs. Gardner's chauffeur over some of the worst of New York's far from perfect pavements. Though the car to which the springs are fitted is a comparatively light Pullman roadster with short wheelbase the ride proved almost a revelation. Time and again the driver raced the car through deep holes and over banked up frozen snow in a manner that



HOLLOWAY'S EQUALIZING SPRING.

at least must have severely taxed if not fractured ordinary springs to say nothing of the discomfort which would have been caused to the passengers. With the Holloway springs, however, the body of the car sustained very little up and down motion, and by reason of the naturally low period of oscillation of the springs there was none of that disagreeable bouncing and violent rebound which makes necessary some form of shock absorbers. In appearance, the springs suggest not a little the ordinary type of full-elliptic members, close scrutiny being required to detect the difference. Their construction is such that they may be attached to any car and the operation is neither expensive nor laborious.

Mitchell-Lewis May Go Into Tires.

According to more or less well-defined reports, the Mitchell-Lewis Motor Co., of Racine, Wis.,—which maintains a London branch—has obtained an option on a new tire which is controlled by the Holmes Engineering Co., of London, and may engage in its manufacture on this side of the water. It is even suggested that an addition to the Mitchell-Lewis plant at Racine, which is being erected, may be employed for that purpose. The tire is said to be composed of scrap leather, ground to a fine powder, and mixed with rubber and certain secret ingredients and compressed under extremely high pressure. It is stated that it is about 25 per cent. more durable and can be sold for about 40 per cent. less than pneumatic tires of the conventional type. Inquiry as to the correctness of the report elicited no reply from the Mitchell-Lewis company.

NOW COMES THE "SPARK ABSORBER"

Ingenuous Device to Permit Use of Engine Starters With Magnets Only—Stores Necessary Electricity.

An unexpected turn of affairs following in the wake of the development of the gas type of motor starter is the realization of the fact that a gas starter cannot be used on a car that has magneto ignition only, for the very elementary reason that the gas must be exploded by a spark, and a magneto is incapable of furnishing a spark when not running. There must be a battery and coil to furnish the current and raise it to the requisite high tension, and if these are not already included in the equipment of the car, they must be added or the gas starter abandoned in favor of compressed air, electricity or springs.

It would appear, however, that there is relief in sight for those who have magneto ignition only, but still yearn for gas starters for their motors. William J. Foster, of 146 West 56th street, New York, has developed a system which permits the storage of electricity at the high tension necessary to jump the gap of a spark plug and produce the necessary igniting spark. The apparatus can be installed in any car and will store up "juice" at high pressure, while the motor is running, and keep it "on tap," ready for use when the button is pressed. The "spark absorber," which is by no means bulky, is installed on the dashboard and has much the appearance of a switch of substantial construction; it is self-contained and easily connected up.

The Foster "spark absorber" has been in use experimentally for a year, and various improvements have been made over the first models. It can be used in connection with any gasoline motor having high-tension ignition. Domestic and foreign patents have been taken out and all the work that precedes commercial production has been finished. Arrangements have been made for manufacturing the device in New York.

Horse Owner With an Eye to Business.

In New Zealand, apparently, they have not yet reached beyond the stage which was rather common in this country several years ago, when automobiles often required the assistance of horses to surmount particularly vile hills. In fact, in New Zealand, this "assistance" appears to have reached the dignity of a near-business; at any rate, one New Zealand publication gives space to the following advertisement of a horse owner: "Motorists traveling towards Taupo and Napier unable to negotiate the Titi-o-Kura Hill, owing to weather or other circumstances, should wire for horses to pull them up. Horses will be sent to the Mohaka cutting. Terms, £ 10s. Napier side, or £2 Mohaka side."

KANSAS CITY SHOW IN OLD JAPAN

Missourians See Cars Surrounded by Oriental Art and Flower-Laden Walls—
The Forty-Five Exhibitors.

Despite the rather crisp, sharp weather which prevailed outside, the delicate blossoms of the Japanese garden which has been laid out to render Convention Hall attractive to the breezy folks of Kansas City, Mo., during automobile show week, were in no wise impaired when the doors opened on Monday last, 12th inst., which, decoratively speaking, is laid in old Japan. At the north end of the hall, directly opposite the main entrance, a lofty Oriental temple, combining all the quaint architecture of the land of Dai Nippon has been erected, while a flower laden garden wall surrounds the two balconies.

The lighting system too, is unique. From the roof of "blue sky," are suspended 33 baskets, each nine feet in diameter, and overflowing with red roses, and greenery, which effectively conceal the source of the tinted light rays. From the tops of the baskets long festoons of roses concealing rows of incandescent lights are stretched to the garden wall. Beneath this handsome bower are exhibited some 57 makes of motor vehicles which are staged by 45 dealers. Accessories which are not numerous are placed in the arcade.

Among the exhibitors are: Dodge-Robinson Motor Co., Woods electric; Bruening Bros. Auto Co., Apperson and Waverley electric; General Motors Truck Co., GMC trucks; Jackson Motor Co., Jackson; McGee-Huckell Motor Car Co., Stoddard-Dayton; Cole Motor Car Co., Cole; Kansas City Transportation and Motor Trucks Co., Adams trucks; Overland Auto Co., Auburn; Mitchell-Lewis Motor Co., Mitchell; Greenlease Motor Car Co., Cadillac; Hupmobile Sales Co., Hupmobile; Buick Motor Co., Buick; Chalmers Motor Co., Chalmers; Anderson Electric Car Co., Detroit electric; Bond Motor Co., Everitt and Krit; Westcott Motor Car Co., Westcott; J. A. Davis Motor Car Co., Thomas; White Motors Co., White; Witwer Motor Car Co., Marion and Garford; J. I. Case Threshing Machine Co., Case; Studebaker Corporation of America, Flanders and E-M-F; United Motor Kansas City Co., Columbia, Maxwell and Sampson trucks; C. L. Taylor Motor Car Co., Reo; Kaw Valley Auto Co., Abbott-Detroit; Albertson-Boyd Motor Co., Marmon and Hudson; Southwest Kissel Kar Branch, Kissel; Electric Truck Co., Walker electric; R-C-H Corporation, R-C-H; Dey-Embrey Motor Car Co., Pierce-Arrow; D. A. Kendall Motor Co., Halladay; Karshner Motor Car Co., Speedwell and Warren; Clark Motor Co., Baker electric; Stevens-Duryea Motor Co., Stevens-Duryea; In-

ter-State Motor Car Co., Inter-State; International Motor Co., Saurer and Mack trucks; Snedeker & Chesnut, Regal; Cartercar Co., Cartercar; Avery Co., Avery trucks; Great-Western Automobile Co., Great Western; Williams Motor Car Co., Locomobile; E. P. Moriarty Co., Packard; Columbus Buggy Co., Firestone-Columbus, Oakland, Columbus electric and Grabow-sky trucks.

First Real Show in Canadian Capital.

Ottawa's first automobile show, that is the first display of sufficient growth to be dignified by the term show, was inaugurated under the auspices of the Ottawa Valley Motor Car Association when the doors of Howick Pavilion at Lansdown Park opened on Tuesday night last, 13th inst., disclosing a representative array of all types of motor vehicles, most of them of American manufacture. For the occasion the pavilion has been made pleasing to look upon by the plentiful use of colored bunting, and several hundred incandescent tungsten lights. Streamers of gold and white, with here and there a red band interspersed to relieve the monotony, are artistically draped so as to conceal the walls, while the ceiling is half hid by bands of gold and white bunting.

Among the exhibitors of motor cars are: Reo Sales Co., Reo; Russell Motor Car Co., Russell; Watson Carriage Co., Commerce truck; Ottawa Taxi and Auto Co., Kelly truck; Ford Motor Co., Ford; Ottawa Beach Motor Co., Overland; Macdonald & Co., Albion truck; Tudhope Motor Co., Tudhope; Peerless Garage Co., Cadillac; Pink-McVeity-Blackburn Co., Franklin, R-C-H, McLaughlin-Buick, Chalmers and Hudson; Taxicabs of Ottawa, Ltd., Jackson; St. Louis Automobile Garage, Cutting; E-M-F Co., of Canada, E-M-F and Flanders.

Grand Rapids Newspaper Holds a Show.

Fifty-two makes of motor vehicles, and not a few accessories, comprise the loadstone which began to draw the Grand Rapids folk to the Klingman building, when the doors opened last night, 10th inst., on the third annual Western Michigan Automobile Show, conducted under the auspices of the Grand Rapids Herald.

The cars on exhibition are the Abbott-Detroit, American, Austin, Broc electric, Buick, Baker electric, Chalmers, Chase, Cadillac, Columbus electric, Columbia, Cutting, Crow-Elkhart, Detroit electric, Everitt, E-M-F, Franklin, Ford, Flanders, Federal, Garford, Havers, Hupmobile, Hudson, Hupp-Yeats electric, International, Kissel, Krit, Lion, Mercury, Maxwell, Mitchell, Marmon, McIntyre, National, Oakland, Ohio electric, Olds Overland, Pierce-Arrow, Packard, Peerless, Paige-Detroit, Rauch & Lang electric, Rambler, Reo, R. C. H., Standard electric, Stearns, Studebaker electric, Stoddard-Dayton, Velie, Westcott, White, Winton.

GREEN AND WHITE AT ATLANTA SHOW

First Exhibit of Dealers' Association Well Attended Despite Bad Weather—Scotch Pipers Furnish Musical Program.

Atlanta's automobile show, the first under the auspices of the Atlanta Automobile and Accessory Dealers' Association, did not suffer from lack of attendance on the opening day, Saturday last, 10th inst., even though the weather was, to say the least, inclement. The Auditorium-Armory, which houses the exhibit for the week, was crowded from 2.30 P. M. at which hour the doors were thrown open, until after the "Kilties," who are doing the musical honors, had piped the homegoing tune.

The 43 different makes of motor vehicles which are staged by some 27 exhibitors, to say nothing of the collection of sundries shown by 10 accessory dealers, are displayed to the best of advantage in a setting the details of which have been well worked out. Although green and white are the predominating colors used throughout the decorative scheme, the white trellis work, which has been built to form a bower over the exhibits, is laden with wistaria blossoms gracefully entwined with southern smilax. The strips of decorative bunting and the numerous streamers which conceal the otherwise bare walls, the signs, electric decorations, and the "automobile flag"—all are green and white.

Among the exhibitors who are displaying motor vehicles are: E-M-F Atlanta Co., E-M-F and Flanders; Herman J. Haas, Winton; J. I. Case Co., Case; Dobbs & La Hatte Co., Autocar; R-C-H Corporation, R-C-H; Northcutt Co., Chalmers and Fiat; Buick Motor Co., Buick; John M. Smith Co., Pierce-Arrow and Apperson; United Motors Atlanta Co., Maxwell, Columbia and Stoddard-Dayton; Georgia Motor Car Co., National, Brush and Everitt; Ford Motor Co., Ford; Mitchell Motor Car Co., Mitchell; Locomobile Co., of America, Locomobile; Overland Southern Co., Overland; C. H. Johnson Co., Stevens-Duryea and Baker electric; The Auto Co., Thomas, Mercer and Oakland; Firestone-Columbus Southern Co., Firestone-Columbus and Columbus electric; F. B. Stearns, Stearns; K. T. McKistry Co., Whiting; Steinhauer and Wight Co., Cadillac and Detroit electric; L. S. Crane Co., Pope-Hartford; The White Co., White; Velie Motor Car Co., Velie; Fulton Auto Supply Co., American, Hudson, Marmon and Peerless; Krit Atlanta Motor Co., Krit; Cole Motor Co., Cole; Imperial Motor Car Co., Imperial.

The accessory exhibitors are: Elyea-Austell Co.; Gewinner Co.; Alexander-Seewald Co.; Atlanta Top and Trimming Co.; Charles E. Miller; George F. Hardy; Standard Oil Co.; Gulf Refining Co.; Wayne Oil Tank and Pump Co., and Reed Oil Co.

MOTOR CARS ON THE "ICY REACHES"

Frigid Weather Enables Establishment of Many "New Records"—Hudson River as Testing Ground and Race Course.

During the unusually long and unusually frigid spell which remained on the Eastern part of the country during the past month, there were rivers and lakes frozen "solid" that had never before been "chained with icy fetters"—that is, not in the memory of the next-to-the-oldest inhabitant. These various frozen rivers gave a goodly number of people the coveted opportunity to pose as the "first to cross So-

arranged for the benefit of a moving picture concern, and audiences throughout the length and breadth of the land soon will be thrilled by the pictorial records of the daring performances of the testers, their brushes with the trains and with the aeroplane, and their "skidding" exhibitions.

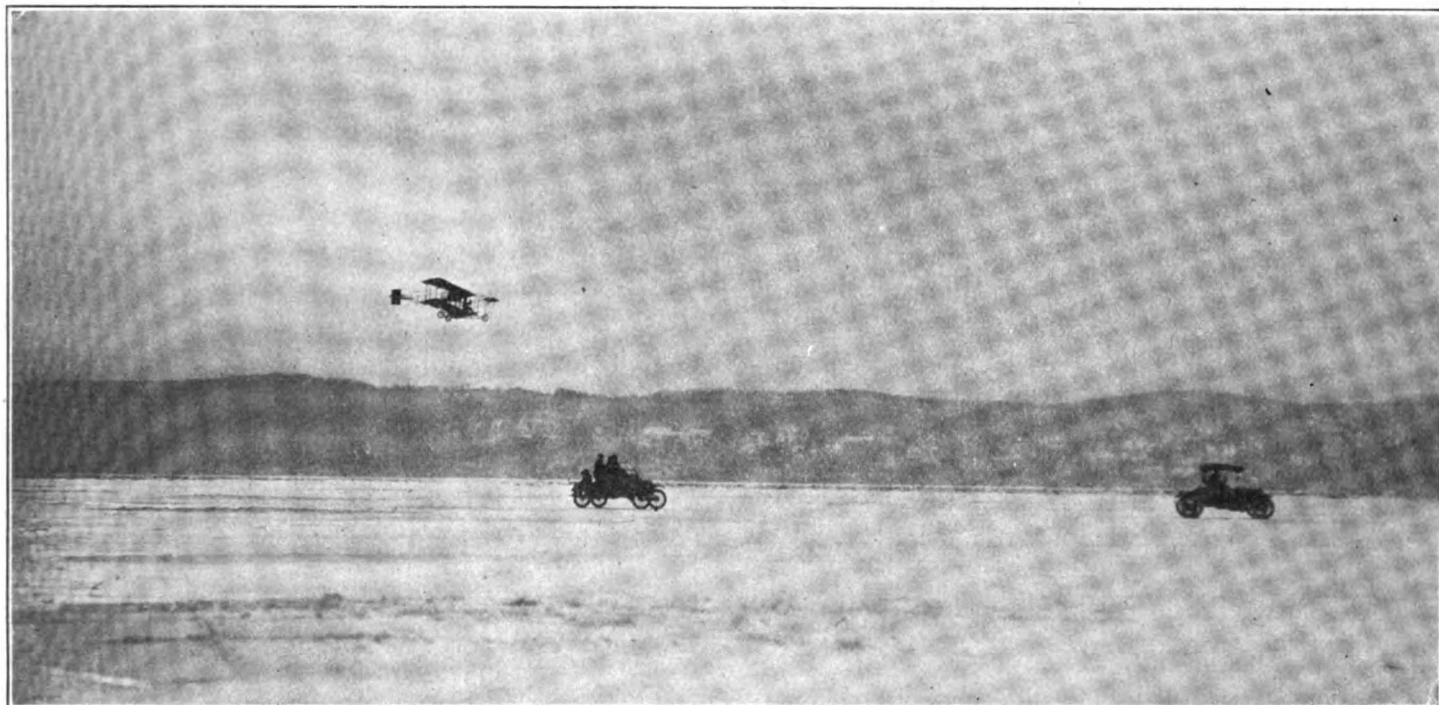
To Increase Penalty of Drunken Drivers.

With the idea of decreasing the number of accidents due to intoxication of drivers of automobiles and other vehicles, there has been introduced in the New Jersey Senate a bill providing for the severer punishment for all persons who in an intoxicated conditions operate any kind of vehicle. The bill is fathered by Senator Hand and makes the operating of any engine, locomotive,

WHEN EMPLOYERS ARE NOT LIABLE

Michigan Court Amplifies Definition Often Brought to Bear—Freed from Responsibility for Chauffeur's Accident.

The liability of a master for the acts of his "servant" frequently has been defined by the courts, and since the advent of the automobile such cases of alleged liability have multiplied extraordinarily. When a case of this sort, however, reaches the Court of Appeals of a sovereign State it is of more than cursory interest to motorists, not so much for the fine points brought out in it, as for the general definition of



WHEN THE FROZEN HUDSON SERVES AS A PLAYGROUND FOR AUTOMOBILES AND AEROPLANES—A MOTION-PICTURE "RACE"

and-So river in an automobile," and otherwise provided sport a-plenty for the motorist. Around Tarrytown, N. Y., for instance, where the Maxwell-Briscoe factory is located, the Hudson at times was alive with testing cars, the drivers of which made the snow—not the hackneyed "dust"—fly in all directions. And after the testing was over impromptu races were held over the frozen "American Rhine," in which Fred Koenig and his big Mercedes car gathered comparatively easy honors.

In addition to ordinary testing and racing there were occasional "thrills" of another kind—such for instance as the pitting of racing cars against ice yachts, against the New York Central express trains and—last but not least—against aeroplanes. In the accompanying picture one of these aeroplanes is shown on the point of swooping down from the heights, after an exciting race with some of the testing cars. The whole racemeet, while seemingly of an impromptu character, was

trolley car, automobile, motorcycle or other motor vehicle or boat or any stationary engine of any description, steam boiler, dynamo or vehicle of any kind, by any intoxicated person, a misdemeanor, punishable by a fine not exceeding \$2,000, or imprisonment not exceeding 15 years, or both. Besides this punishment the license shall be revoked.

\$1,250 for Half of One Finger.

A verdict of \$1,250 for two inches of a finger lost in a machine was returned in the Superior Court of Indianapolis, Ind., in favor of Frank H. Holtman and against the American Motor Car Co. According to the evidence presented, the plaintiff, who is a minor, was working on one of the machines which was unprotected and his hand was caught in a jig. The case is said to be the first of its kind in the Indiana district, to be tried under the new factory law, which requires protections on certain kinds of machinery.

the extent of liability in case the master is absent from home, and the servant (chauffeur) is employed by a near relative of the master in work which was not "in the course or scope of his employment, or authority."

In a case of the sort, which was argued before the Court of Appeals of the State of Michigan, William R. Roach was the defendant in a suit for damages arising from an accident in which the automobile belonging to Roach ran down and injured a man named Luke Riley.

According to the testimony taken before the Circuit Court William R. Roach had been absent from home for several days, while Mrs. Roach was ill at a neighbor's cottage, leaving the Roach cottage in charge of a distant relative, and the Roach automobile in charge of a chauffeur, who had been engaged only nine days previously, and who had been given specific orders never to take out the car without orders from the owner or his wife. On

the day of the accident a certain Mr. Daggett took one of Roach's relatives and two other persons in his car to Oceana Beach, when his gasoline supply became exhausted while three miles north of Hart. No supply store being handy, Daggett telephoned to the garage in which Roach's car was stored for a can of gasoline. Roach's chauffeur brought the gasoline in the car belonging to Roach, having as passengers Roach's sister and two friends. After the gasoline had been transferred to the Daggett car, Leslie Hall, the Roach chauffeur, returned home and on his return trip collided with the buggy of Luke Riley, the plaintiff.

The suit for damages against Roach, as owner of the car, which subsequently was instituted by Riley, was dismissed by the Circuit Court, on the ground that the plaintiff had not made a case. This decision was upheld by the Court of Appeals. The opinion handed down by Judge Stone, in which the appeal was denied, states that "the test of the liability of the master for his servant's acts, is whether the latter was at the time acting within the scope of his employment. The phrase 'in the course or scope of his employment, or authority,' when used relative to the acts of a servant, means while engaged in the service of his master, or while about his master's business. It is not synonymous with 'during the period covered by his employment.' From the record the court believes that it appears uncontradicted that the chauffeur acted in direct violation of his instructions, and outside the scope of his employment. He was acting either upon his own motion, or was obeying the instructions of Mr. Daggett, or someone else who had no authority to bind the defendant."

Eight Contests Sanctioned by A. A. A.

To date, exactly eight events for the 1912 season have been sanctioned by the Contest Board of the A. A. A., and dates officially assigned. These are track races at New Orleans, La., February 17th and 18th, promoted by E. A. Moross; road race at Bakersfield, Cal., on February 22nd, by the Kern County Auto Racing Association; commercial vehicle reliability run, on May 15th, 16th and 17th, by Chicago Motor Club; 500 mile speedway race at Indianapolis, Ind., on May 30th, by Indianapolis Motor Speedway; Algonquin hill climb on June 30th, by Chicago Motor Club; beach races at Galveston, Tex., on August 8th, 9th, and 10th, by Galveston Auto Club; speedway race at Indianapolis, Ind., on September 2nd, by Indianapolis Motor Speedway; reliability run, on October 7th to 11th by Chicago Motor Club.

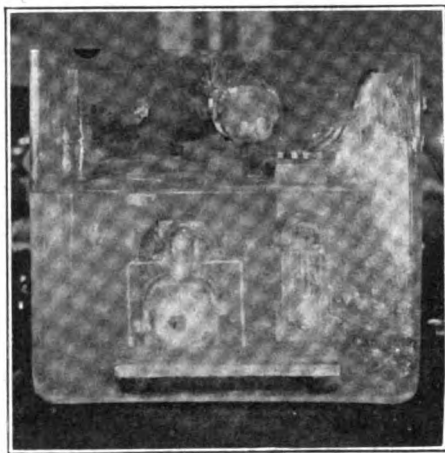
Eighteen proposed contests are on the slate, but they have not yet been sanctioned, the official assignment of dates being reserved, pending the compliance on the part of the promoters with the requirements of the Contest Board. The more important among these latter are the Santa

Monica road race, on May 4th by Motor Car Dealers' Association; Old Orchard, (Me.) beach races on July 4th, 5th, and 6th, by Old Orchard Auto Association; Riverhead Road race, Riverhead, L. I., some time in July; Elgin Road races, on August 23rd and 24th, by Chicago Motor Club; Fairmount Park road race, Philadelphia, Pa., on October 5th, by Quaker City Motor Club.

It is quite certain, however, that several of the proposed events never will get beyond the "proposed" point.

Ran Lighting System in Acid Bath.

Novel ways of demonstrating the efficiency and durability of special apparatus designed to be attached as auxiliary to the machinery that ordinarily composes an automobile have not been scarce nor have some of them been other than really unique. It is doubtful, however, if any exhibit ever was more unique than was



ESTERLINE'S ACID TEST

the display arranged by the Esterline Co., of Lafayette, Ind., for the edification and education of visitors to the Chicago show. The Esterline Co. manufactures the Berdon lighting system, and carrying the familiar idea of immersing its product in water a little further than is usual, the company made its display a veritable acid test by adding to the water a quantity of sulphuric acid. Both the generator and the automatic controller were completely immersed in the solution, contained in a big glass "aquarium," and despite the dissolving action of the fluid, continued to operate, the generator being driven as a motor, during the whole two weeks of the show, although both were so covered with sediment as to be almost indiscernible. The illustration shows the equipment at the end of the first week of its most unusual and strenuous test. All the metal parts of the generator and the controller are badly corroded and the interior of the controller is filled with copper sulphate and sediment. There is also half an inch of sediment in the bottom of the jar and on the board on which the equipment rests. Lighting systems are not supposed to operate in an acid bath, of course, but that

they will operate, and operate satisfactorily, under conditions that are a great deal more severe than ordinarily is possible has been demonstrated by the Esterline Co.

Dayton Show a "Hurrah" for Dayton.

With three different makes of motor vehicle, and four displays of accessories which are of local manufacture, mingled with the usual complement of exhibits, the show which opened in the Memorial Hall on Monday last, 12th inst., under the auspices of the Dayton Automobile Club, assisted in placing the Gem City in a class by itself on the local show circuit.

The Speedwell, the Stoddard-Dayton, and the Dayton truck all epitomize what Dayton has accomplished in the motor car production, while Delco and Aplco engine-starters and ignition outfits, silver lamps and L-C-R storage batteries are home products in the accessory line that indicate where the car goes, the accessory follows.

The space allotted to the 18 exhibitors of motor vehicles is occupied by Cadillac Motor Car Co., Cadillac; G. W. Shroyer & Co., Pierce-Arrow, Mitchell, R-C-H, Hup-Young electric and Columbus electric; Hosler-Overland Sales Co., Overland and Locomobile; Standard Motor Car Co., Hudson and Marmon; Empire Motor Car Co., Cutting; Heathman-Solliday Co., Paige-Detroit and Abbott-Detroit; Dods Motor Car Co., Chalmers; G. G. Peckham Motor Car Co., Buick, Peerless, White, and Baker electric; Miami Valley Auto Co., Marathon and Reo; Dayton and Troy Automobile Co., Ford; H. P. Michaels Sales Co., Hupmobile and Staver; Marion Motor Car Co., Marion; American Sales Co., American; Ohio Auto Co., Republic and Pathfinder; Baker-Speedwell Agency, Speedwell; Dayton Automobile Co., Winton; Stoddard-Dayton Sales Co., Stoddard-Dayton; Dayton Electric Car Co., Baker electric.

The accessory exhibitors are: Patterson Tool Supply Co., Mead Engine Co., Standard Oil Co., L. C. R. Storage Battery Co., Dayton Equipment Co., Gerkins Oil Co., Economical Tire Co., Moore Oil Co., Silvey Electric Co., Dayton Engineering Laboratories Co., Apple Electric Co.

The show will continue until Saturday next, 17th inst.

Skidding Mishap from an Unusual Cause.

Skidding is generally attributed to the inability of the tires to obtain a grip on the road surface, owing to the presence of a film of either water or oil. But one day last week Charles Millang, of Bayside, L. I., received injuries which will in all likelihood prove fatal, when his car skidded and turned turtle from an entirely different cause. The roadway was perfectly dry, but the flexible tubing connecting the horn with the bulb became disengaged, and sliding under the front wheel, caused sufficient side-slip to bring the machine against the curb, where it turned completely over.

NEW PLACE FOR PNEUMATIC "TIRE"

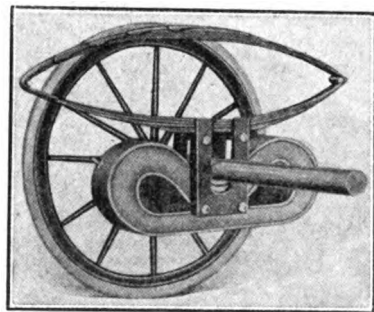
Lifted Off the Ground and Placed "Out of Harm's Way"—Company Formed to Market Odd Invention.

Barring only the problem of perpetual motion, which as every one knows is impossible of solution, it is doubtful if there is any which has been attacked more frequently and with more persistence than that of producing some device or method of construction which will eliminate the necessity for pneumatic tires. That none of them has proven the success which its inventor hoped for, probably for the reason that none has been designed with the thought in mind that it is the initial impact with the road which must be overcome, has not deterred other inventors of equally hopeful dispositions from attempting the solution of the problem, one of the very latest solutions which has made its appearance being one which is sponsored by the Suspended Pneumatic Tire Co., of 1777 Broadway, New York City.

The device, which has been patented by John Williamson, who formerly was engaged in the real estate business, but who at present is the president of the newly formed company, is shown in the accompanying illustration and it may be seen that it is radically different from the usual form of pneumatic tire eliminator. It is not a pneumatic tire eliminator, but it does eliminate the pneumatic tire in the sense that a tire is a band which encircles a wheel. In other words, to quote the patentee himself, "it is designed to do away with the pneumatic tire on the ground and place it where it will be safe from all danger of punctures, cuts, friction or wear of any kind, except such as will result from the natural wear on the rubber." In construction, the device is a peculiarly shaped metal casing which hangs below the axle and encloses the pneumatic tire which is not a tire at all. Between the "tire" and the casing there is another member shaped like the casing and attached to the spring of the car so that the weight of the car is supported on the "tire" which is squeezed between the casing and the inner member. The theory of the device, it is explained, is that when the wheel strikes an obstruction it causes the air in the lower part of the "tire" to be forced into the upper part thus cushioning the shock of the impact, the rebound shock also being cushioned and governed in intensity by the rate of flow of air from the upper part back to the lower part. The device is not quite ready for the market, however. Though the company is incorporated for half a million dollars its coffers are not quite as full as as they might be and hence there has been some delay in manufacture. Consequently it is proposed, "in order to accumulate a

fund to manufacture and place the device on the market," to part with some of the stock of the company, half of which is seven per cent. preferred and the other half common. The shares are only \$100 each.

In the meantime the inventor is very positive that the device will work and will really put the pneumatic tire manufacturers out of business. According to the prospectus of the company there is reason for the optimism for "the device can be attached to any pleasure car or commercial car running to-day, without altering, in any way, its present equipment or condition; it can, in the same way, be applied to horse-drawn vehicles; in the case of light delivery vehicles, steel tires may be used if so desired, the device will give you pneumatic riding just the same." As for the price, it is stated that it may be in the neighborhood of \$100 for complete



SUSPENDED PNEUMATIC TIRE

equipment, but inasmuch as the equipment is guaranteed "with a real guarantee" to run 10,000 miles, the cost really is not so very much. Besides a new "tire" will not exceed \$5 in cost and is "bound to last until the rubber becomes 'porus,' or naturally gives out."

Things That Injure a Car's Paint Work.

A stable, or any place adjoining a stable, is a very poor place to keep a motor car if the owner is particular as to the appearance of the varnish. The fumes of ammonia will cause the varnish to crack and disintegrate, entirely spoiling its appearance in time. Oil is destructive to varnish, so far as its glossy, bright finish is concerned, and should not be allowed to remain on it. Another very prolific source of damage to varnish is the improper removal of mud. The really proper thing is to wash off the mud before it becomes hard, and to do so by flowing water over it rather than by rubbing. If, however, the mud has hardened, it should be soaked before any attempt is made to take it off. When soft, it can be "sluiced" off. The idea is that rubbing off mud has exactly the same effect as rubbing with fine sandpaper, and the result will be the formation of a dull spot where the mud was. These dull spots, which are "pittings" in the surface of the varnish, cannot be removed save by sandpapering and revarnishing.

TO STANDARDIZE MOTOR TRUCKS

S. A. E. Committee Makes Recommendations as to Overload and Speed—Other Factors to be Discussed.

Supplementing its standardization work in the pleasure car field, the Society of Automobile Engineers has taken up in earnest the standardization of commercial vehicles, the first meeting of the special committee which was appointed to thresh the matter out having taken place last week. At the meeting practically all the members of the committee were present. Most of the discussion revolved around the question as to the exact manner in which the problem should be attacked, and it was decided first that it is desirable to attempt to standardize the sizes or capacities of trucks, from the purchaser's or user's standpoint, and afterward to extend the work with a view to aiding the manufacturers in standardizing design.

An effort was made to determine the specification of normal load and overload of trucks of from one to five tons capacity, and it was decided by vote that each truck should be capable of rendering normal or continuous service under its tonnage rating and have an overload capacity for temporary or emergency service of 25 per cent. of its normal tonnage capacity. By a similar vote a schedule of desirable speeds was obtained, though this and the other matter are merely tentative and are to enable the committee to make a start. The speeds which were recommended are as follows, though it is likely that at subsequent meetings the table may be revised: one-ton trucks, 15 miles; two-ton trucks, 12 miles; three-ton trucks, 10 miles; four-ton trucks, nine miles; five-ton trucks, eight miles.

Considerable discussion took place as to what should be the determining factors for capacity, and it was agreed that the committee would take under consideration in this connection horsepower expressed in speed and dimensions of the motor, as well as in drawbar pull of the truck in completed condition. The other determining factors which will be considered are: springs—length, number of leaves, width and thickness; frame, in so far as the general dimensions are concerned; brake surface, expressed either in superficial dimensions or in effect; size of gear teeth and pitch; size of sprockets and chains; tread; spring center dimensions; proportion of load on front and rear axles.

It is to be expected, of course, that the committee will rely to a considerable extent on the co-operation of manufacturers, and to this end it was voted that manufacturers be invited to submit specifications of standard models as well as their recommendations of what the critical specifications of essential elements should be.

TWO-CYCLE ROTARY VALVE MOTOR

Unusual Features Ingeniously Combined by
a British Inventor—Makes Use of a
Two-Diameter Piston.

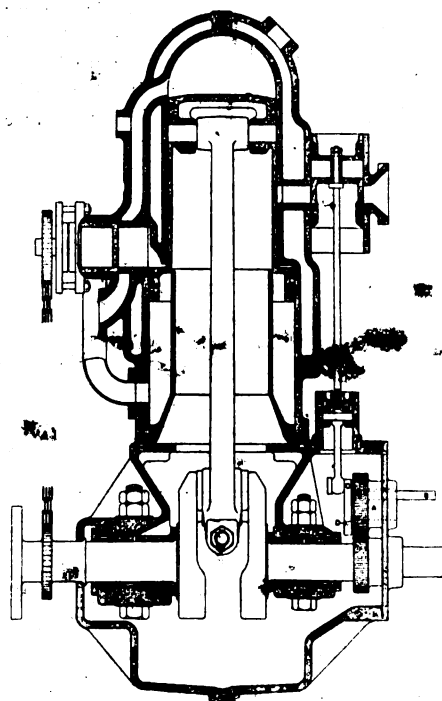
Though the two-cycle motor holds great promise, the greatest drawback to its more general use has been its lessened efficiency at other than certain speeds. It has been stated that it is essentially a "one speed" motor, and though numerous attempts have been made to overcome this difficulty, there has yet to be produced a two-cycle motor which shows the efficiency and flexibility of the four-cycle type. In the opinion of not a few engineers the principal reason for the lack of progress on the part of two-cycle engine designers lies in the fact that simplicity has been placed ahead of efficiency, and that if the two-cycle engine ever is to show the efficiency of the four-cycle type a certain amount of simplicity must be sacrificed in the incorporation of suitable valves to control the gases.

It is on this principle that E. H. Micklewood, who is a British engineer, has been working for several years, and he has succeeded in producing a two-cycle motor which is a combination of the familiar differential piston type with a piston valve to control the exhaust and a rotary valve to control first, the admission of a charge of compressed air to the cylinder for scavenging purposes and afterward the admission of the explosive mixture. Several years ago the same inventor drew attention to his peculiar engine, but in the interim it has undergone considerable refinement, until at present it is claimed that its efficiency and flexibility are in no degree less than can be obtained with a four-cycle motor.

A single cylinder is shown in section herewith, from which it may be seen that the piston is rather longer than is usual and the lower end is of larger diameter than the upper end. The lower end of the piston is confined between the cylinder wall and a fixed sleeve which is shown in solid section. The piston valve which controls the exhaust gases is shown at the right and is actuated through gearing from the crankshaft. The double rotary valve which controls the admission of pure air and mixture, is at the other side of the cylinder and is driven from the crankshaft by means of a "silent" chain.

When the mixture in the cylinder is fired, the piston being at the top of its stroke, fresh mixture is drawn into the space above the enlarged portion of the piston and between it and the cylinder wall, while at the same time pure air is compressed below it. At the bottom of the stroke, the rotary valve cuts off the communication with the carburetter and at the same time opens communication for the compressed air be-

low the enlarged part of the piston to reach the combustion chamber. Just before this, however, the piston has exposed the exhaust port and exhaust has commenced, this being rendered more complete by the sudden ingress of air under compression. The air inlet is of very short duration, however, for immediately the piston commences to rise the rotary distributing valve closes the air passage and at the same time opens communication between the combustion space and the mixture space above the enlarged part of the piston, allowing mixture under pressure to find its way into the combustion space. By the time the piston has reached top head center, compression being complete, the rotary distributing



MICKLEWOOD TWO-CYCLE ENGINE

valve has opened communication between the outer air and the space between the enlarged portion of the piston and air is drawn in to be compressed, and the same cycle of functions carried on during the next revolution of the crankshaft.

Though the reduction of the weight of reciprocating parts has been one of the problems with which automobile engineers have been most concerned, and the Micklewood engine is deficient in this respect inasmuch as the weight of the piston is considerably greater than ordinarily is the case, it is pointed out by the inventor that by reason of the position of the lower air port, which allows the lower end of the piston to compress a small amount of air at the end of its downward movement, the extra weight is counterbalanced.

Though single cylinder engines of this type probably would require that a reservoir be provided to store the compressed air used for scavenging purposes, this difficulty is overcome in multi-cylinder engines by connecting all the air outlets to

a common pipe from which the rotary distributing valve admits it to the cylinders at the proper moment. Another point which is worthy of note is that the size of the combustion chamber is larger than usually is the case for a four-cycle engine of the same cylinder dimensions, and this is explained by the fact that a larger volume of mixture is drawn over the piston than is drawn into the cylinder of a four-cycle engine. For this reason it is claimed that compression is more uniformly maintained. Already, it is stated, one of the largest manufacturers of British cars has one of the motors under test, and it is not unlikely that if the tests prove satisfactory cars equipped with the new engine soon will be marketed.

"Chauffeusing" on a Modified Plan.

There have been "chauffeuses" before this—in Paris, London, Berlin and even in New York—but never before has an "ad" like the following appeared in a New York paper:

EXPERIENCED young lady chauffeur offers her services with luxurious electric coupe to lady convalescents, shopping parties or recreation; best physicians' references.

The young lady who chose this rather unusual way of finding employment for her car and herself is Mrs. Alice E. Waxham, of New York City, a physician's wife, and she explains her choice of "profession" by her love for outdoor work. "For weeks and weeks," she declares, "I studied the problem. I wanted outdoor work, but found little encouragement in the fields open to women. I wanted to keep my car, too, and make it help me, but I could not see how to do it. I did not want to consider merely hiring out my machine with myself as a driver. I did not want to come into competition directly with men nor lose altogether the atmosphere of femininity in whatever I should do."

"At last I decided that I would hire my machine and my services as driver to women invalids, convalescents or for shopping, and I would drive it myself. When I had gone through my first two years at Wellesley I dropped the regular course to take up medicine, but did not complete that course either. As soon as I felt that I had selected the occupation that would bring adequate returns, keep me outdoors and permit exercise of the only talents nature had given me, I sold my gasoline car and bought a low swung comfortable electric, which I knew would be the ideal vehicle for the classes of women whom I hope to have for patrons."

One Method of Blackening Aluminum.

To blacken aluminum, first clean thoroughly with glass paper and apply a coat of olive oil. Heat the metal until the oil burns, when the aluminum will have turned yellow. Apply another coat of oil and reheat and a jet black coat will be the result.

FOUR-WHEEL DRIVE; ITS PRINCIPLE AND OPERATION

One of the Earlier Forms of Transmission That If It Has Not Flourished Has Refused to Die—
Tire Economy and Other Advantages That Serve to Render It Attractive
—Some of the Several Systems That Are in Use.



ADAPTION OF COUPLE-GEAR TRACTOR TO ONE OF THE NEW YORK FIRE DEPARTMENT'S WATER TOWERS

From the very beginning of its existence the motor car has been driven through its rear wheels, and the front wheels have done the steering. This was the easiest and the most obvious arrangement from the point of view of the early designer, and what held good 20 years ago holds good to-day, the cars embodying other methods of applying power and controlling direction being few and far between. There is a reason for this other than that of following the path of least resistance. So far as the pleasure car is concerned, rear wheel drive and front wheel steer seem to be so satisfactory that there appears to be no particularly strong argument in favor of any different arrangement, except in occasional instances.

The commercial vehicle, however, pre-

sents a different set of problems and conditions, and though at the present time there are very few makers whose cars are not rear driven and front steered, there are those who believe they discern a tendency to recognize the possibilities of a vehicle with a practical system for driving and steering through all four wheels. Perhaps the most important single item in the bill in favor of the "quad" drive and steer is the economy in tires that follows logically. All four wheels sharing equally in the work to be done, the weights, of vehicle as well as of load, are distributed so that all wheels carry as nearly as is practicable the same weight. This point is of particular moment in heavy vehicles, for though tire economy in light trucks and wagons is of course a matter of import-

ance, the tires used on the big machines are so enormously expensive, and the loads carried come so near the limit of endurance of tires of practical size that anything that will ease the burden on the rubber, without introducing offsetting effects, is clearly of value.

The control of a four-wheel drive and steer vehicle is so worked out that it does not differ materially from that of a car of the more conventional type. All wheels are driven at once, and all turn at the same time in steering, the usual single hand-wheel being connected with all four road wheels. The result is that the driver has no extra levers to manipulate and he has no more to do than on a two-wheel drive machine. On some "quads," notably the Cleveland truck, there is a lever by means

of which the front wheels may be locked and steering accomplished through the rear wheels only, or the rear wheels locked and the front wheels used in the conventional way for steering. Ordinarily the front and rear wheels swing in opposite directions in steering—that is, if the front wheels turn to the right, the rear wheels turn toward the left, so that the wheels “track” in making a turn. In the Cleveland truck the wheels can be coupled so that they all point in the same direction and the truck can move obliquely. This sometimes is useful in congested traffic where the swing of the body caused by the usual steering, either with two or four wheels, would interfere with getting out of a tight place. The extra lever does not add to the driver's troubles in any way because he can ignore it entirely unless he gets into a corner where nothing but the additional steering facilities would get him out.

Where conditions are favorable—roads smooth, not slippery or muddy, and grade surfaces such as to afford ample traction—there would be no serious obstacle to placing a considerable proportion of the load on the front wheels, or, in other words, to the approximately equal distribution of weights, except perhaps the difficulty of steering with heavily loaded wheels; but where roads are slippery with “grease” or ice, where they are deep with mud or snow, or where the grades have surfaces which do not afford ample traction, it becomes imperative that the rear or driving wheels should be so loaded that they will be enabled to obtain traction under practically all conditions. So important is this matter that in some cars the load carried is balanced over the rear wheels, and in others the load is placed so that 80 per cent. of the weight will be on the rear wheels. It goes without saying that when the load runs up to 10 or 15 thousand pounds, or even more, the rear tires are very severely taxed, and though the tires are increased in width and, in many cases, in diameter, in order to provide sufficient rubber to do the work, these huge tires cost much money, and their life is short. It is of course well known that tire manufacturers guarantee their tires for so many miles service, so that the user is sure of getting at least that mileage; but obviously the tire maker has to protect himself in fixing prices, and though not a few tires have to be replaced under the guarantee, nominally at the dealer's expense, the consumer ultimately pays the bills.

With all four wheels carrying equal weights, there are two directions in which economy lies—weight distribution and power application. With equal distribution of weight, tires of moderate size can be used on all wheels without overtaxing their carrying capacity, and with no danger of tearing them from their fastenings on the wheel rim—an occurrence by no means rare in heavy vehicle tires. The chances

of cutting and tearing up the rubber are greatly lessened, and the slipping of the driving wheels, which is bound to be extremely hard on the rubber when the load is heavy and the motor powerful, is practically eliminated.

By driving through four wheels instead of two, each wheel has to transmit but 25 per cent. of the power instead of two wheels taking 50 per cent. each. Obviously this greatly reduces the tearing effect on the tires and correspondingly lengthens their useful life. Still another point is that when four-wheel steering is employed in combination with four-wheel drive, the power always is exerted in the direction in which the wheel is moving, so that a certain amount of lateral strain is eliminated, and there also is some economy in the use of power on turns because the rear wheels are not called upon to push the forward wheels while they are turned at an angle to the direction in which the power is being applied. This item assumes considerable proportions when the vehicle is ploughing through heavy snow or mud, and it is well known that a “quad” will negotiate “heavy going” that would stall a machine having less tractive power and less advantageous means of applying power.

The traction obtainable by the use of four “live” wheels makes the four-wheel drive system particularly valuable in the construction of tractors, in which pulling power is at least as important as carrying capacity. It is well known that in building freight locomotives the greatest possible amount of weight is placed on the driving wheels, and, moreover, the number of driving wheels is considerable, sometimes running as high as ten. The same principle governs in the four-wheel drive truck, but the theory is carried to the limit, for every ounce of weight is on the driving wheels and all the wheels drive. Consequently the “draw-bar pull” is very high. For instance, a five-ton Couple-Gear truck, without load, will, if securely “moored,” exert a pull of about 6,000 pounds before the wheels slip, provided the road surface is good. Advantage is taken of this point in heavy haulage by using a four-wheel drive tractor which carries on a pivot or “fifth wheel” the front end of the load-carrying body, the rear end of which is mounted on two steel-tired wheels of the ordinary horse-truck type. In this way the rubber tires carry only about one-third of the load, the balance being on the steel-tired trailing wheels. The rubber tires are loaded well within their limits, but the four-wheel drive feature gives ample traction, notwithstanding the comparatively light weight. The effect of this arrangement on tire life is striking. A set of tires on a tractor used in this way will give approximately two years' service, the load carried being eight tons, while a five-ton two-wheel drive truck, working under the same conditions, would wear out its tires in six

months. Under ordinary road conditions a four-wheel drive truck will pull behind it all the weight its motor or motors are capable of moving, without slipping the wheels, even without load on the tractor; with the tractor loaded the motors usually will stall before the wheels will slip.

The tractive feature of the four-wheel drive system has been made use of by the Fire Department of New York City, which has in service a water tower, formerly horse-drawn, but now having its front end mounted on a Couple-Gear gasoline-electric motor. The four-wheel steer makes it possible to handle these tractor units satisfactorily when moving backward, which seems not to be practicable with two-wheel steering.

Many ingenious plans have been made and much work has been done in order to solve the knotty problem of quadruple drive and steer, but most of these enterprises have quietly gone over to the “silent majority,” leaving only the lessons taught by failure. The complications and other disadvantages incident to the accomplishment of the desired end either outweighed the gains or so nearly equaled them that there was not sufficient margin left to form a basis for commercial success. Both mechanical and electrical transmission of power have been utilized. Mechanical systems have, for the most part, been extensions of the familiar shaft drive, both front and rear axles being of the live type and the wheels driven through universal joints so as to permit simultaneous steering and driving. The most serious drawback to this system has been the very great loss of power through the transmission system, which, in a typical case, included the usual clutch and gearset, chain drive to a longitudinal shaft, three differentials—one for each axle and the third in the longitudinal shaft to compensate for differences in speed of rotation of front and rear wheels which, though slight, must be allowed for—two sets of bevel gears and a total of six or eight universal joints and numerous bearings.

Inevitably each link in this chain of mechanism took its toll, small or great, of friction, and the proportion of energy that actually reached the wheels was small. Nevertheless, by the use of a powerful motor the machine worked well enough to prove the merits of four-wheel drive; but though it was possible to keep all of the parts working some of the time, and some of the parts working all the time, it was impossible to keep all the parts working all the time. This machine was a heavy truck, having a capacity of eight tons, and was built some five or six years ago, when heavy trucking problems were not as well understood as they are to-day, which accounts for a certain amount of the trouble experienced. Later the same general principles were applied to smaller commercial vehicles and in one or two cases to pleasure cars, none of which, however, seem

to have progressed much beyond the experimental stage.

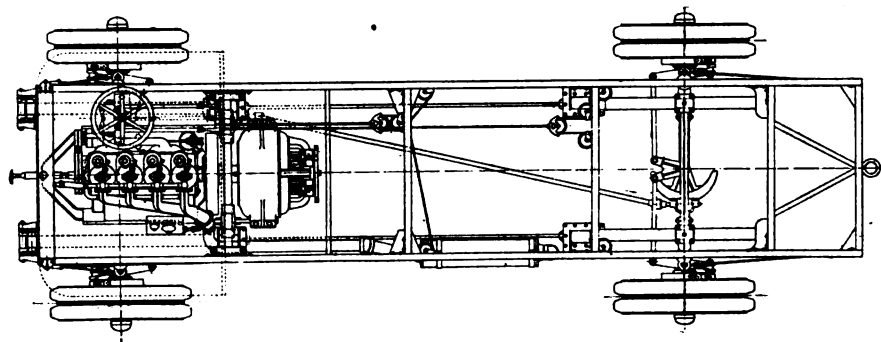
A modification of the mechanical drive system has been applied to a lighter type of car by the American Motor Truck Co., which something more than a year ago brought out a vehicle with a four-wheel drive and steer in which much clever engineering was brought into requisition to reduce the frictional losses of the older systems. Both axles are live axles, but the universal joints are not in the wheel hubs, but at the point where the live shafts enter the differential casings. The two

practicable to build vehicles that are efficient in heavy pulling at slow speeds. For this reason the usefulness of the system will be greatly restricted unless very great improvements are made in the slow-speed direct current motor. Even the manufacturers of vehicles of this type do not recommend them for heavy grade work.

An ingenious application of electricity to the driving of all four wheels consisted of extending the axle stub carrying the wheel inward, or on the side opposite the wheel, and mounting on it an electric motor driving the wheel through encased

used in place of spokes and assembled with convex sides out and their edges fitted into steel rims, the whole forming a casing that is water-tight and dust-proof. The wheel runs on two very heavy roller bearings in two cast steel hub members, one hot-riveted to each of the disks. The electric motor is enclosed in the wheel and is carried by the stationary axle stub—or, rather, the axle is carried by the motor, as the illustration shows, the steel castings forming the body of the motor being made with the axle stubs integral. The motor is set with its armature shaft in a horizontal position and at right angles to the wheel axle; in other words, the armature shaft runs lengthwise of the car. The motor as a whole is of what is called the "pancake" type, having two field coils, one above and one below the armature, so that the whole structure is quite narrow.

The motor, held stationary, drives the wheel, which revolves around the motor, something after the fashion of the spinning squirrel cage, which runs around the animal which drives it. The drive, however, is peculiar in that it is double, there being a bevel pinion at each end of the armature shaft, these pinions meshing with two large bevel gears bolted to the edges of the wheel disks, of course inside of the wheel. One of the armature shaft pinions meshes with the gear ring on the back disk, or the disk nearest the frame of the car, and the other with the gear on the front disk, so that when the armature is rotated both pinions, though rotating together, drive the wheel



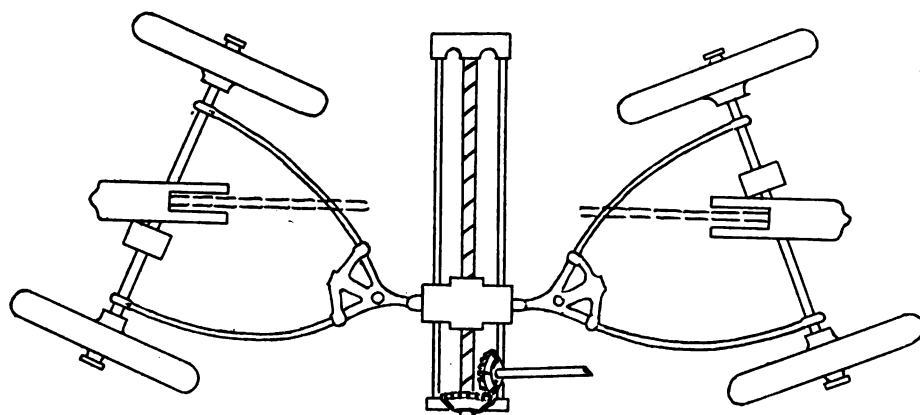
COUPLE-GEAR GASOLINE-ELECTRIC FOUR-WHEEL DRIVE CHASSIS

halves of each live axle are connected by a yoke shaped like a wishbone, the apexes of the two yokes being brought together at the center of the vehicle, where they are connected to a nut working on a transverse screw rotated through gearing from the steering wheel. The effect is curious in appearance, in that the axles appear to swivel on a pivot in the gearcase while the gearcase itself remains stationary. Drive is by two chains, one to each axle.

Electrical transmission offers a number of advantages for four-wheel drive cars and has been made the basis of various systems. Perhaps the most alluring idea, theoretically at least, is to make "every wheel its own motor," the armature, of the stationary type, being built on the axle, inside the wheel, and the coils of the rotating fields secured to the wheel so as to revolve with it, the whole being enclosed in the enlarged hub casing. In this form of construction the only wearing part in the commutator, which can be made of disk form, instead of a cylinder, and thus provides ample surface without materially widening the wheel. Entire absence of gearing makes this a silent outfit, and vehicles built with such wheels are absolutely without mechanical noises due to the driving mechanism. The system is used to some extent abroad, and examples have been seen in this country; in fact, there is a western concern that a short time ago was preparing to manufacture commercial vehicles of this type, though recently nothing has been heard from this source. Unfortunately, it is a very difficult matter to build an electric motor of small power and of the very low speed necessitated by this construction, and it does not appear to be

spur gears. The gearing gave a double reduction and the machine apparently worked well; but disappeared several years ago from the market. It is probable that the mechanical losses in the four sets of gears were quite serious.

The system that has had the longest



DIAGRAMMATIC SKETCH OF AMERICAN CHASSIS SHOWING DRIVE

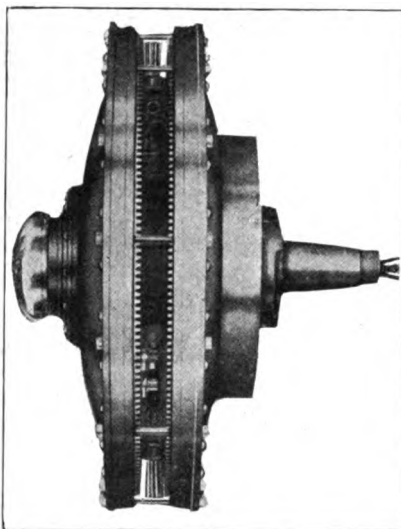
commercial existence, and the only four-wheel drive and four-wheel system that has remained on the market for any length of time is that of the Couple-Gear Freight-Wheel Co., of Grand Rapids, Mich., a number of whose machines, all of large capacity, are in service in New York city as well as other localities throughout the country. The Couple-Gear truck is of interest because it has been in use long enough to give a very good idea of what may be expected of four-wheel drive and steer under actual working conditions extending over considerable periods of time. Electrical transmission is employed. The wheels are made of dished steel plates

in the same direction. It is necessary, of course to place the armature a trifle askew to allow the pinions to mesh at opposite sides of the rim in this way; this is accomplished by boring the armature tunnel off the line to the requisite amount, and boring the shaft bearing brackets, which are integral with the motor body castings, accordingly. The bevel gear rings are made as large as the diameter of the wheel will permit, and have 225 teeth; the pinions, in the case of the heavier trucks, are as small as is practicable, having 9 teeth, thus giving a single rear reduction of 25 to 1. This makes it possible to use a comparatively small, high-speed motor, so that even at

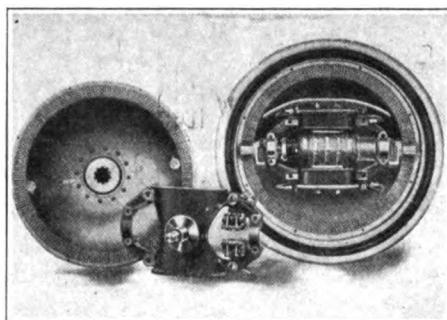
low speeds the armature rotates at economical rates, from a current-consuming point of view, and the power available for slow, heavy work is great. For lighter and faster trucks, the number of teeth in the pinions is made greater, the limit being fifteen teeth, the large gears remaining the same.

The most important detail of the whole wheel, however, is the equalizing device placed in the armature shaft; without this the system would be useless. The armature pinions are carried by two separate shafts—in fact, each pinion with its shaft is cut from a single piece of steel. The pinion shafts slip into a hollow sleeve which constitutes the armature shaft proper, their ends not quite meeting in a cylindrical box which is practically an enlargement of the tubular armature shaft, at the end opposite to the commutator; one pinion shaft is long and the other short in order to bring them together in the box. The adjoining ends of the pinion shafts are connected by yokes at diametrically opposite points and the yokes are driven at a point midway between the shaft ends by a pin whose ends are fast in the walls of the box. The effect of the arrangement is to allow the pinions a slight movement simultaneously in opposite directions, this movement being relative to the armature. The device is, in effect, a differential with a motion that is limited because short levers or yokes are used instead of gears, and it is designed automatically to compensate for wear of gear teeth, the motion due to wear of wheel bearings and of armature bearings, any one of which would be quite sufficient to put a wheel "out of business" without equalizing means. While the "evener," as the makers call it, was worked out as an adjuster of unavoidable mechanical differences, it has developed an action that was not anticipated. In the first truck built on the Couple-Gear system it was found that the teeth of the gears showed considerably less wear than was expected, and that the wear of the bearings was all at top and bottom, indicating an absence of the side-thrust that might have been expected, and, in fact, was looked for, from the action of the gears. Upon investigation, it developed that the action of the equalizer caused the gear teeth to exert very little pressure except when meshing at the pitch line, the point where the sliding motion of the teeth upon each other is at its minimum. As might be expected, the reduction of friction and wear is accompanied by high efficiency, and according to tests made by the United States Bureau of Standards with one of the wheels from a Couple-Gear searchlight outfits built for the army, the efficiency of the gearing, including the losses through the roller bearings, is 97.5 per cent. with the wheel working at normal load. As these bevel gears are the only gears used, it is evident that the mechanical transmission losses are extremely small.

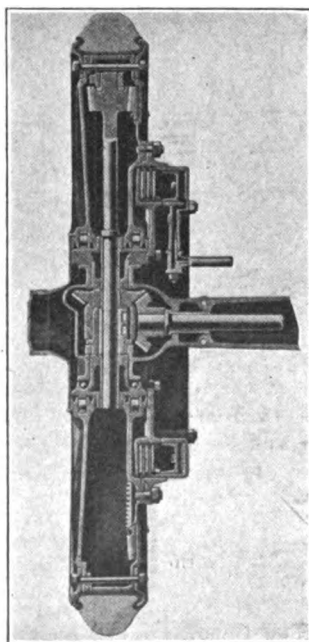
The motors are series wound and are rated at 2 horsepower each, with an overload capacity of 200 per cent. momentarily.



COUPLE-GEAR WHEEL DETAILS



COUPLE-GEAR MOTOR WHEEL



CLEVELAND WHEEL IN SECTION

A controller with six points gives as many speeds ahead and the same in reverse. For very heavy pulling the motors are grouped in series by placing the controller handle

in the proper notch, while for ordinary running the motors are in series-parallel. There are four safety fuses, one in circuit with each motor, so that any excess of current will melt the fuse and interrupt the circuit before damaging the winding; but only the fuse to the motor affected will "blow," leaving the other three to divide between them the extra work, which they do automatically, each motor taking whatever current it requires. Under ordinary conditions the truck will do its work with two motors working, provided there are no severe grades to be climbed. This is a strong point in favor of a four-wheel drive system in which each wheel has its own driving motor. A damaged wheel can be removed bodily, with its motor and driving gear, and replaced by a spare wheel. Plug connections for the cables which run through the hollow axle stubs are easily made, the plugs and receptacles being so arranged that they will not go together except in such a position as to make the connections properly.

Hand holes are cut in the outer disk of each wheel to give access to the motors for oiling and cleaning. Covers are fitted which are tight without packing, and the whole wheel can be run through water up to the hubs without leaking. While it might seem that the enclosed motor would be very liable to overheat, such is not the case, the reason being that the comparatively thin steel disks offer a very large radiating surface. Moreover, the motors under ordinary conditions of work do not heat sufficiently to cause any danger; they are made capable of withstanding a very high temperature by being wound with asbestos insulated wire.

Steering gear is of the worm and sector type, each axle carrying the gearing for its pair of wheels and the two gears being connected by means of a shaft running from front to rear. The drawing shows this arrangement very clearly.

Many serious difficulties have beset those who have sought to design four-wheel driven trucks with purely mechanical transmission systems; but it by no means follows that this type of machine is "out of the running." On the contrary, there are several makes of light vehicles, with quadruple drive and steer, that now are in actual service and promise well for the future. The car built by the American Motor Truck Co., of Michigan, is familiar to those who saw the big motor car shows of 1911; the Commercial Motor Car Co., of Houston, Tex., builds the Brandon trucks; the Cleveland Motor Truck Co., of Cleveland, O., builds a machine embodying some very ingenious ideas, and the Four-Wheel Drive Co., of Clintonville, Wis., builds pleasure cars with all wheels "alive." Double bevel gear drive is employed in the Cleveland truck, but the chief point of interest is the drive from the live shafts to the wheels, all of which turn on vertical pivots for steering. The outer end of each live axle

shaft carries a bevel gear which meshes with a similar gear on a vertical shaft enclosed within the wheel and extending upward, terminating in a pinion which meshes with a large bevel gear secured to the inside of the wheel. The pivot upon which the wheel turns is in the center of the hub, which does not turn with the wheel, but carries roller bearings upon which the wheel rotates. As the steering pivot and the vertical driving shaft are exactly in the same line, no universal joint is required, the relations of the gears being undisturbed by the swinging of the wheels in turning. Differentials of the conventional type are dispensed with, each wheel being equipped with a device which permits it to coast free when running faster than the gears would drive it, though unable to turn backward against the power.

In the Brandon truck the drive to the four wheels is wholly through shafts and gears, but there are no steering knuckles or their equivalents. In steering each axle swings on a central pivot, like the front axle of a horse-drawn vehicle; the steering gear is of the worm and sector type. There is a differential to compensate for differences in rotative speeds of front and rear pairs of wheels, and also differentials, or their equivalents, permitting relatively different speeds of the wheels of each pair.

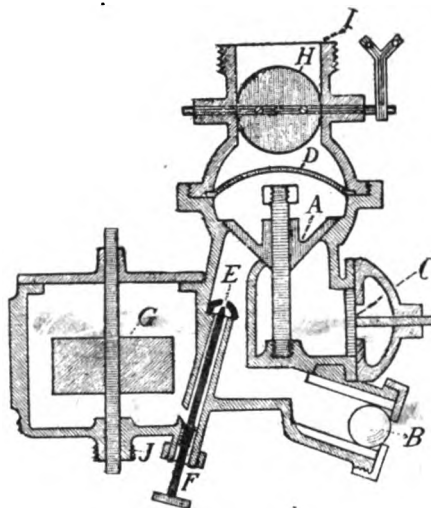
Comparatively few attempts have been made to develop four-wheel driven pleasure cars, but the Four-Wheel Drive company has unlimited faith in the principle and has had its first car in active service for two years. Propeller shaft and bevel gear drive is employed, and there are universal joints of special construction to transmit power to the wheels at the steering knuckles. A characteristic of the four-wheel drive and steer system which does not become evident in slow speed cars, but has been brought out strongly in the pleasure car, is that skidding is very greatly reduced—in fact, under anything but the worst conditions it is eliminated.

A system that permits four-wheel drive of course will permit front-wheel drive, which makes it possible to convert a horse-drawn vehicle into a front-driven motor vehicle by the use of a pair of mechanically driven steering wheels and a suitable power plant. There are many existing horse-drawn vehicles of special construction that are well adapted to conversion in this way. A big ambulance belonging to the S. P. C. A., used in New York for the transportation of sick horses, has been converted, using Couple-Gear front wheels and a small gasoline motor and dynamo, the whole power plant located at the front under the floor, leaving the rear of the vehicle undisturbed. A fire engine has just been converted in New York by the Christie system of front drive, the frame of the fire engine having been lengthened forward and the gasoline motor and driving mechanism mounted on the extension. The Couple-Gear system of front drive is being ap-

plied to another engine, and already has been applied to a number of former horse-drawn trucks, some of which have been in service as motor trucks for a year or more.

Carburetter Which Prevents "Back-Fire."

To obviate the possibility of back fires resulting in a general conflagration of the car to which the device is attached in addition to operating to furnish an explosive mixture to the engine is the purpose of the Sunderman safety carburetter which is marketed by the Sunderman Safety Carburetter Co., recently incorporated at Newburgh, N. Y., to manufacture and deal in patented articles. The actual manufacture of the carburetter, however, has been



SUNDERMAN SAFETY CARBURETTER

intrusted to the Generator Valve Co., which will turn out the new device at its Brooklyn (N. Y.) factory. The main offices of the promoting company are at 117 Broadway, Newburgh, N. Y., where the business of selling the carburetters will be carried on.

In aspect, the Sunderman carburetter is not altogether unlike many of the existing types which are on the market though in construction it differs radically from anything else of its kind. Its principal feature of construction and the one for which the greatest claim is made is its safety valve, denoted A in the accompanying sectional view. The action of this valve is such that when the engine causes suction in the intake pipe the valve is lifted off its seat permitting a charge of carburetted air to be drawn into the cylinders. Immediately the suction ceases the valve is returned to its seat by means of a spring. Consequently in the event of a back fire the valve is closed not merely by the pressure of its spring but also by the pressure of the exploding gases. But to prevent even the possibility of a back fire passing the safety valve, and thus issuing into the air, the slow speed air valve (B) is made in the form of a ball check. In addition to serving as a sort of secondary safety valve, it is explained that the ball check also operates to make for easy

starting by ensuring a rich mixture when the engine is "cranked." Another of the distinctive features of the device is a "baffle plate" (D) which is in reality a fine gauze screen inserted just below the throttle opening, its purpose being to break up the mixture and ensure its homogeneousness. In the arrangement of the other essential parts of the carburetter there is little that is out of the ordinary. Gasoline enters the float chamber at J, its height being governed by a metal float (G). The needle valve (E) is provided with a means of adjustment (F) and additional air required for high speed work is admitted automatically through a spring controlled valve (C) separate from the low speed valve.

By reason of the fact that the mixture must strike both the safety valve and the baffle plate before it is drawn into the cylinders it is claimed that greater efficiency results and that gas pounds and knocks are practically eliminated.

Means of Improving Electroplating.

Electroplating in any of its branches is not the easiest kind of work from which to obtain even a fair average of good results. The greatest possible cleanliness is absolutely essential and even then there are almost the proverbial hundred and one things which must be carefully watched for and avoided. Nickel plating is perhaps one of the branches which is more susceptible to the petty annoyances which prevent perfect work being turned out every time than any other, and it is doubtful if there is any trouble which is more assiduously watched for than the formation of bubbles on the object which is being plated. Such bubbles cause pit marks and small hollows on the plated surface. Recently, however, a German inventor has found that conditions may be materially improved by the addition of a small quantity of boric acid to the plating bath, the exact amount being three parts of boric acid by weight to each 100 parts of solution. This prevents the formation of hydrogen bubbles. As the boric acid does not dissolve readily in the cold, it is recommended that a small quantity of the bath be removed and heated with the boric acid. If it is then added to the bath there will be produced a clean nickel deposit which is slightly softer than usually is the case, for which reason it may be more readily polished.

To Charge a Battery in a Hurry.

If it should be necessary for any reason to charge a storage battery in the shortest possible time, the safest way is to use a heavy current during the early stages of the charge, when there is not so much danger of heating as when the charge is nearly completed. Under no circumstances should the last half of the charging be done at a high rate; toward the end, in particular, the charging must be slow if injury to the plates is to be avoided.

KEEPING THE COMMUTATOR CLEAN

One Thing About the Electric Vehicle That is Best Left Alone—What to Do in Event of Trouble.

If there is anything connected with an electric vehicle that should be shunned, avoided and left to itself, it is a commutator that is in good condition, with the beautiful brownish glaze that indicates that all is well.

It sometimes happens, however, that a commutator really needs attention, and if such is the case, the work cannot be done any too soon, for trouble multiplies rapidly. If the maker of the motor has given directions for the care of the commutator, they should be followed to the letter; if convenient, it is just as well to have an experienced man do what is needed and take no chances. Sometimes, however, there are no directions or instructions, there is not a man available, and—the machine must run. Then the following general suggestions may be used, mixed with common sense.

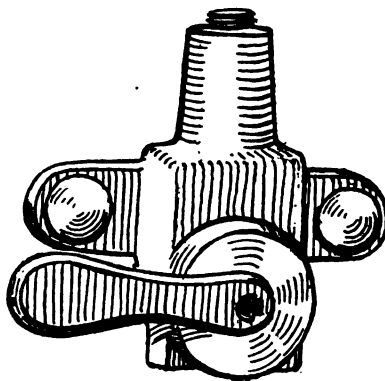
A commutator that has a surface scratched and streaked so that the raw red copper shows, usually is suffering from the presence of foreign matter on the brush faces. The first thing to do is to look at the brush faces, which probably will be found to have adhering to them little specks of copper. Fine sandpaper is the remedy—No. 00 or No. 000—with which the brush faces should be dressed, care being taken not to alter their curve and not to round off the corners. Then, with all brushes removed, the commutator should be lightly smoothed with No. 000 sandpaper, the motor being rotated in any convenient way and the sandpaper held against the commutator and moved constantly so that there will be no tendency to make continuous scratches. Use a small piece of sandpaper and it will wear smooth and finally will give the copper a uniform polish without scratches. Carefully wipe away all dust, see that the brushes and brush holders are perfectly clean and all contact surfaces bright, and put the brushes back in position, being particularly careful to replace them in the same positions they were in before removal.

Use the brushes recommended by the maker, and unless specifically instructed to do so, do not use any oil, vaseline or lubricant of any kind on the commutator or brushes. On the contrary, see that no oil reaches the copper surface. It is a common thing for motor brushes to be made with a small quantity of some lubricating substance worked into the pores of the carbon, and if any lubrication is needed this supplies it. Changing the make of brushes is a decidedly risky thing to do, except under the advice of someone who knows what he is talking about.

Occasionally a commutator, especially of a rather large motor, will evince a tendency to blacken in use, showing a sooty-looking surface that may be confined to some of the segments while others are quite clean and look to be in good condition. This may be due to "high mica"—that is, the mica insulation between the commutator segments is higher than the surface of the commutator, due to its being so hard that it wears more slowly than the copper. As each brush passes over a high mica, it is lifted from the copper, and the current

Lock That Prevents Loss of Gasolene.

With a view to the prevention of "mysterious" disappearances of gasolene from the tank, the Globe Auto-Lock Co., of Canistota, N. Y., which recently was formed, has brought out a very neat device styled the "auto-lock," which is designed to circumvent losses of gasolene through the petcock, either by accidental or designed "leak-



age." The lock, which is shown by the accompanying illustration, is enclosed in a casing which is bolted to the sill of the body, outside, and is connected with the shut-off valve by means of a rod; the only way the valve can be turned is by means of a small detachable key which is left in the lock when the gasolene is turned on and is removed when the fuel is shut off. In addition to preventing the theft of gasolene, the lock may be useful in preventing the theft of the car itself, as it cannot be run without fuel. Also, in case of fire it is an easy matter to shut off the gasolene from the outside, as the key is always in the lock when turned on.

forms an arc which blackens both copper and brush and, if permitted to go unchecked, will pit the copper. Neglect of high mica means the ultimate destruction of the commutator and possibly other serious injury to the motor. It is possible for a commutator to become so worn and pitted on one side, through localized abrasive action, that it will run "out of true" and the brushes will move up and down in their holders at every revolution. In this case there is nothing to do but take the armature out and have the commutator turned off in a lathe—a job which should be done

by a skilled mechanic and should not be attempted by an amateur.

In some motors the mica insulation between the commutator segments is cut down so that it is below the copper surface, there being narrow grooves between the bars. This entirely prevents trouble from "high mica" and, if it is necessary to remove an armature and have the commutator turned as a result of trouble from this cause, it is a good idea to have the mica cut down at the same time. It is a piece of work that has to be done carefully and with skill and judgment, however, and there are many otherwise competent electrical mechanics who cannot make a good job of it. Particular care should be taken to keep the spaces between the bars clear of carbon dust and other foreign matter; while practically all dirt is thrown out by centrifugal force, something may catch and lead to short circuiting. A sliver of hard wood or bone is a good thing to clean out the grooves with. A knife blade or other steel tool is hardly safe because it is extremely easy to turn up a little shaving of the soft copper and make a "short" or raise a rough edge that will tear the surfaces of the brushes. As a temporary expedient, a "high mica" commutator may be given a thorough course of sandpaper treatment.

Insufficient tension of the springs that hold the brushes down to the commutator surface may result in a blackened commutator, for the road vibration will cause the brushes to jump out of contact, and every time this is done while the current is on there will be an arc between brush and commutator and a tiny black spot formed. The remedy is, of course, in the adjustment of the springs, which must not be made too tight, however, for excessive commutator and brush wear would result. The springs should be just tight enough to keep the brushes down to their work, and, once out of adjustment, only experiment and experience can indicate just the right pressure for the purpose.

A commutator that is worn in grooves by the brushes is not necessarily in bad condition. If it is perfectly circular, so that the brushes have no up-and-down movement, and the surface is good, it is all right. But the brushes must fit accurately, or excessive arcing will occur. Changing brushes on such a commutator is rather a delicate piece of work and one not to be undertaken lightly by a novice. There now are many motors in which the brushes are a little wider than the commutators, so that there is no tendency toward grooving, unless the brushes are of uneven hardness, so that they wear faster in some places than in others, the commutator following suit. This, however, is very unusual if good brushes are used.

Sandpaper is the only safe thing to use on commutators or brushes. Emery has a bad habit of embedding itself in copper or carbon and staying and scratching. Coarse sandpaper cuts too deeply for this work.

STARTING WITH THE GEARS IN MESH

Too Frequent Cause of Serious Accidents and Few Preventatives Available—Some of Those Within Reach.

To the experienced chauffeur who has spent several years of his useful life in driving cars and in cranking them, the possibility of starting a motor with the gears in mesh and the clutch engaged may perhaps appear more or less of a joke. But that it is no joke to the layman requires but a cursory perusal of the daily papers. Not many days pass without the chronicle of an accident due to the gears-in-mesh source, and he must be an unobservant mortal indeed who has failed to notice that recently such occurrences have steadily increased in number until they are no longer uncommon.

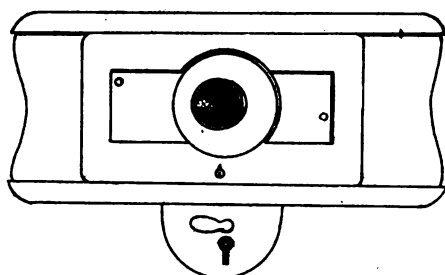
The cause of the trouble is plain, of course: It is simply carelessness on the part of the driver in neglecting in the first place to place his gear shift lever in the neutral position immediately he stops his motor and in the second place to make certain that it is in the neutral position before he attempts to crank the engine. Only in this way can disasters such as have become frequent be voided. Obviously, however, the fact remains that it is "up to the driver" and in view of the fact that no human mind is infallible and even the most careful driver may in time make the fatal mistake it is reasonable to expect that until some positive method of eliminating the human factor is evolved the public prints will continue to devote space to "cranked-with-the-gears-in-mesh" accidents.

The problem is not easy of solution, though there are few evidences that it really has been attacked. Years ago, when automobiles first began to be really numerous, manufacturers took a sort of half-hearted shy at it by inter-connecting the emergency brake lever with the clutch so that when the brake was applied the clutch automatically was thrown out of engagement. Some cars still are made that way, though there is a tendency to abandon such construction. It serves its purpose in one respect, and in another it really makes the hazard greater for the simple reason that it encourages the practice of leaving the gears in mesh when the car and motor are stopped. In not a few cases mischievous youngsters, inquisitively inclined, have released the emergency brake thereby laying the driver open to the danger which it was the purpose of the manufacturer to avoid. The method therefore scarcely is as satisfactory as it might be.

American motorists are not the only ones who occasionally crank their motors with the gears in mesh. British and other foreign motorists also make the same mistake at times, and it is to a British inven-

tor that one of the first practical methods of eliminating the possibility of trouble of the kind is credited. It is a clever little device in the form of a sliding plate which fits between the starting crank ratchet and the teeth on the end of the crankshaft extension. It has been placed on the market by Messrs. Wardill & Son, of Carshalton, Surrey, and is shown in perspective in the accompanying illustration. By means of suitable wire cables and links the plate is connected to the gear shift lever in such a way that when any of the gears are in mesh it is impossible to engage the starting crank ratchet. It is also supplied with a lock and key by means of which it may be locked so that the motor cannot be started with the crank.

There is another way in which the difficulty might be overcome and which is a great deal simpler than the British inven-



WARDILL'S SAFETY LOCK

or's sliding plate and numerous rods and cables. It is to place a simple series circuit between the change-gear quadrant and the starting crank so that when the gears are in mesh the engagement of the starting crank ratchet will short circuit the ignition current. Of course when the car is being driven the ignition current will not be short circuited for the simple reason that the starting crank ratchet will not be engaged. An alternate method which is perhaps not quite so refined, but which undoubtedly would have the desired result is to so wire the quadrant and the starting crank that when the gears are in mesh and an attempt is made to crank the motor the operator will receive a gentle jolt from the high tension current. The simplest method of all, however, is to place a friction clutch between the starting crank and the engine so adjusted that the engine can be cranked only when the gears are out of mesh.

Obviously, any one of the various engine-starting devices which are on the market solves the problem by eliminating it entirely, for if the driver is in his seat—where he really ought to be—when the engine is started he is removed from all danger of being inadvertently and unsuspectingly run over. Not all cars are equipped with engine starters, however, though it is likely that in the near future there will be few that will be without them, and in the meantime there is at least one field of endeavor to which embryo or full-fledged inventors might well turn their attention and devote their energies.

PREST-O-LITE'S LIGHTING SYSTEM

Permits All Lamps or Any Lamp to be Lighted from Seat—Simple Employment of Jump Spark.

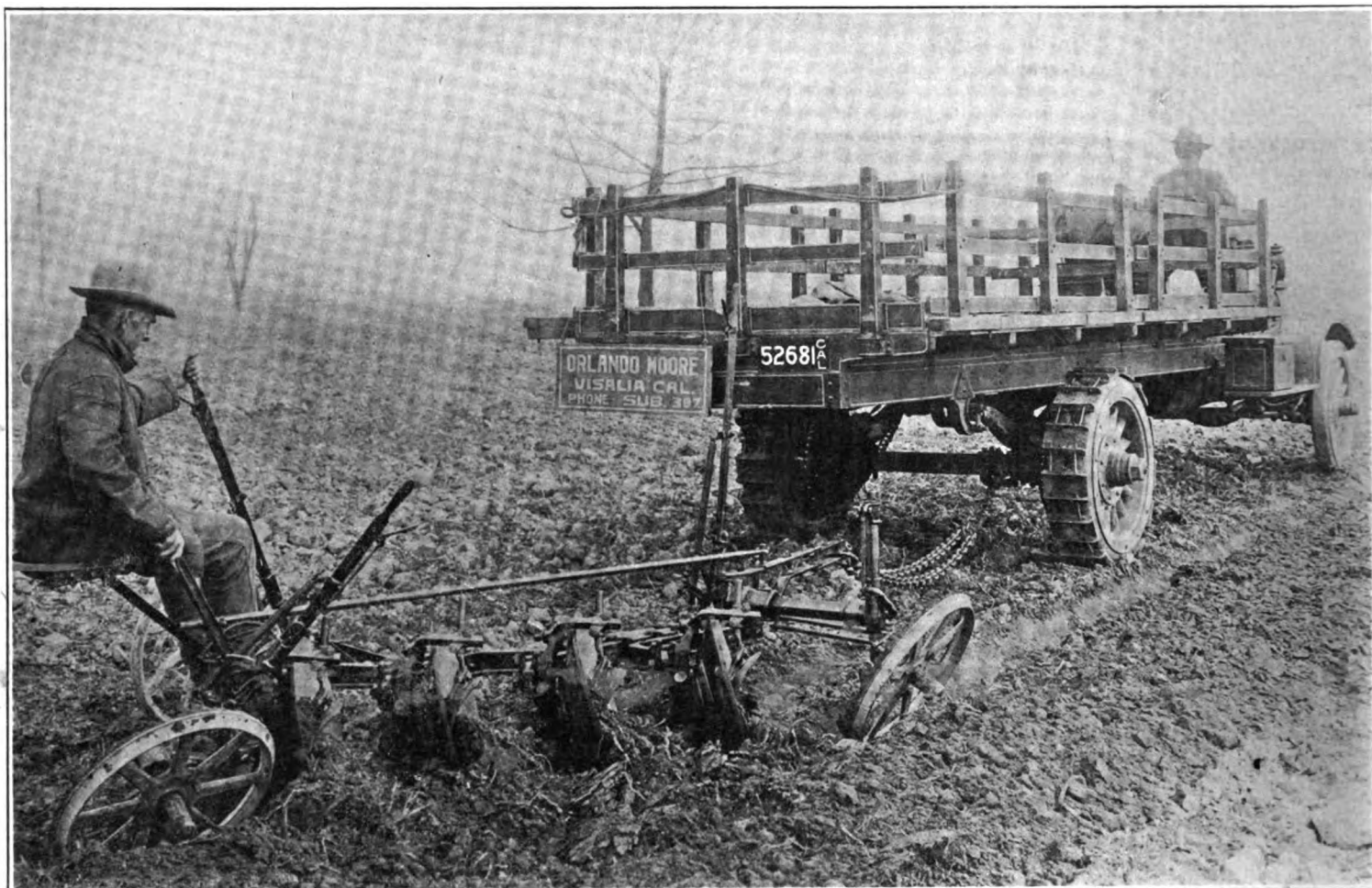
Supplementing the well-known Prest-O-Lite acetylene tanks and the recently perfected Prest-O-Starter, the Prest-O-Lite Co., of Indianapolis, Ind., has added to its line a new lamp lighting system which for simplicity of construction and dependability is well up to the high standard of merit which the company has set for itself and which it has maintained. The source from which the light is derived is a Prest-O-Lite tank, of course, though any other acetylene tank or generator may be used with the system. Other than the piping which is necessary in any case, the system consists of a bank of four very small valves arranged side by side on a base for attachment to the dash, the requisite number of special burners according to the number of lights which are to be equipped, a miniature jump spark coil, a dash button to operate the coil, and the patented Prest-O-Lite reducing valve used in the engine starting system.

By means of this valve, which is really one of the more important parts of the system, the pressure in the piping is controlled and cannot exceed two ounces regardless of the amount the tank valve is opened. Thus it is necessary merely to open the tank valve and leave it open until the tank is exhausted, the pressure in the piping being so low as to require only ordinary precautions to insure against leakage. The system is designed to operate five lamps,—two headlamps, two side lamps and the tail lamp—one of the valves serving to control the supply of gas to all the lamps which are connected in series on the same pipe and the other three valves serving to control the two headlamps, the two side lamps and the tail lamp, respectively. By manipulating the valves any or all of the lamps may be lighted at will merely by pressing the dash button which operates the spark coil. The burners also are connected in series with the spark coil and are fitted with metallic spark points so placed that the heat of the acetylene flame cannot harm them. The coil is operated by the ignition battery, or by four dry cells.

Trustee Offers Stepney Remains for Sale.

George Spier, trustee in bankruptcy of the United States Wheel and Rim Co., Ltd., of St. Anne, Ill., which went into the hands of a receiver in September last, is offering the assets for sale. The United States company was the outgrowth of the Stepney Spare Wheel Co., which, although flourishing abroad, for some reason failed to make any progress in this country.

THE MOTOR TRUCK AS AN AID TO AGRICULTURE



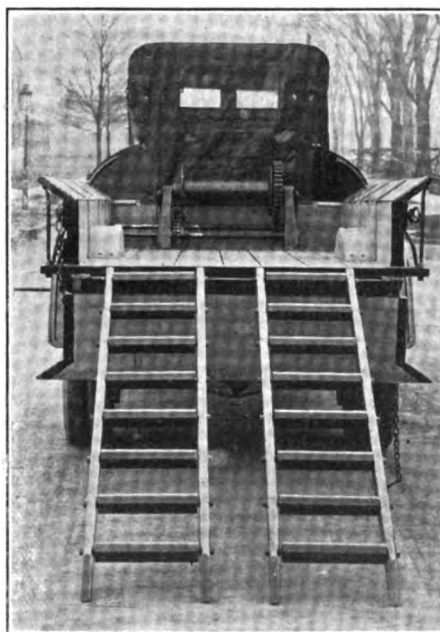
THE MOTOR VEHICLE ON THE FARM—KISSEL TRUCK HAULING A DISK PLOW IN CALIFORNIA

Here's a "Motor Hearse" For Horses.

Not only is the automobile taking the place of the horse as a means of transportation of freight and passengers, but, used as an ambulance, it is contributing to the care of "man's best friend," in sickness, and as the accompanying illustration shows, it now is used to give the animal its last ride—to the fertilizer factory. The vehicle—a hearse for horses, it might be not inaptly termed—illustrated is a White truck of 2,500 pounds carrying capacity purchased by J. L. & H. Stadler, of Cleveland, O., to transport defunct equines to their fertilizer factory, where the last particle of usefulness is extracted from the "remains."

The machine is fitted with a special body having a drop tail gate and two roller "skids" which form an incline from the ground to the truck platform. The dead horses are hauled up the roller-way by means of a cable winding on the drum of a geared windlass placed at the extreme forward end of the platform, just behind the driver's seat, the windlass being operated by means of a hand crank on the left side of the car. The chassis is of the standard type for 1½-ton trucks built by the White company, the body being the only special

feature. It is not often that the economy that can be realized by the use of motor



cars for commercial purposes is so strikingly illustrated as in the transportation of material for fertilizer manufacture.

"Young Gentleman's" Touching Appeal.

Despite the belief that exists to a greater or less degree in the "tight little isle," not all of the "brass" in the human family is contained in that portion of it which inhabits the United States. Evidence of the fact is contained in the following "touching" appeal which recently appeared in the advertising columns of the London Times:

"Young gentleman of good family appeals to 1,000 generous people for 1,000 guineas to build a powerful automobile to enable him to earn a livelihood. It will be named after the book 'Scarlet Runner,' and will ply for hire in the West End of London, driven by advertiser. It will be available for tours at reasonable charges."

Great Britain's Consumption of Gasolene.

During the year 1911 there were imported into Great Britain no less than 68,167,317 gallons of gasolene valued at £1,612,267. During the previous year the record was 55,049,210 gallons valued at £1,340,551.

Breakage of electric bulb filaments can be prevented to a greater or less degree if the lights are lighted for several minutes before the machine is used.

AFTER GASOLENE—WHAT? KEROSENE OR ALCOHOL?

Some of the Reasons Why Gasolene is Expensive and Kerosene Cheap—Carburation Problems That Affect Employment of Heavier Fuels—Early Experiments That Sought Solutions—Possibilities That Appear to Be Offered by Present-Day Acetylene Engine Starters.

What will come after gasolene? Since the internal combustion motor finished its creeping days, got up off its knees, so to speak, and commenced to strike its gait—a gait that caused the price of gasolene to soar from next to nothing to figures that made kerosene look cheap—the question has been asked often and earnestly, and the pauses between questions have been only partially filled by attempts to answer satisfactorily.

Not that there is no satisfactory solution of the problem. On the contrary, the work that has been done with fuels other than gasolene indicates very clearly that when the proper time comes—that is, when the sharp spur of demand starts its insistent prodding—there will be little delay in furnishing motors that will run on other hydrocarbons than gasolene, and do their work just as well as the gasolene motor—and perhaps better. And certainly at less cost for fuel, for while the demand for gasolene is steadily going up, taking the price with it, the demand for kerosene does not by any means keep pace with it; and as the distillation of gasolene involves the production of a much larger quantity of kerosene, which must be marketed in order to avoid loss, it is clear that the refiners will not be likely to load their tanks with a lot of unsalable kerosene for the sake of producing gasolene to sell at a low figure. Illuminating gas and electricity have played sad havoc with the sale of kerosene, but nevertheless it must be sold—so many gallons for every gallon of “gas.” Gasolene sells easily, and the price is high. Kerosene is comparatively hard to get rid of; so the price is low. Kerosene hangs like a millstone round the neck of gasolene, so to speak, keeping down the production. It seems inevitable that unless an outlet is provided for kerosene, gasolene will go heaven knows how high in price. Should kerosene be adopted as motor fuel, however, the turn of the tide might have the somewhat curious effect of putting gasolene where it formerly stood, and making it a commodity of less value than kerosene.

There is no doubt that kerosene has advantages as a motor fuel, for it is cheap, and probably always will be cheap, and its efficiency as a fuel is practically the same as that of gasolene—a little higher, if anything. And it is much safer to handle on account of its lack of volatility—its high vapor tension, to be really scientific. But this very quality of safety makes it extremely difficult to gasify, and nothing but

the application of heat, and plenty of it, and the maintenance of heat so that, once gratified, there will be no condensation, will make kerosene run a gas motor. But with plenty of heat, properly applied, kerosene can be made to produce splendid results. A few years ago a car was built in New York for experimental purposes, and it had a kerosene motor. The whole secret of its really fine running lay in the fact that everything the kerosene touched was kept piping hot by the exhaust gases, and even the air supplied to the carburetter was thoroughly heated before it came into contact with the spray. Of course, gasolene was used to start with. There was a two-way cock which, turned one way, supplied the carburetter with gasolene, and the other way, kerosene. Once the motor was heated up, the cock could be turned either way, so that the engine ran on either fuel, or left half way over, so that the fuels mixed, and no difference could be discerned in the running of the motor—light or loaded—or in the exhaust, which was absolutely clean and odorless.

While the possibilities of kerosene as a fuel are made clear by this, as well as by many other similar experiments, the liquid has two disadvantages. It cannot be used for starting, so that two tanks must be carried, one for gasolene for starting and the other for the regular fuel. And in the second place, kerosene is disagreeable stuff to handle. It sticks and smells, and its pungent odor is notably penetrating. Its very virtue of safety helps to make it unpleasant, for it evaporates with the most exasperating deliberation, and leaves behind it a reminder for the nose.

Alcohol seems to occupy a place midway between gasolene and kerosene, in some respects, and to be in a class by itself in others. It is easier to vaporize than kerosene, but harder than gasolene. It is as good a fuel as either. It requires more heat for its gasification than gasolene and less than kerosene—considerably less. And yet it is not so volatile that it is dangerous to handle, for it is considerably less liable to accidental ignition than the more familiar fuel. It is beautifully clean, and leaves no stain of any kind upon evaporating. Alcohol has another virtue that is decidedly interesting. It has a very decided affinity for water so that the two liquids mix readily. In fact, commercial alcohol always contains a small percentage of water. Therefore a little water accidentally working its way into the tank can

do no harm, for it mixes so thoroughly with the fuel that it cannot affect the action of the carburetter in the least. The fact that the “get-rich-quick” type of garage proprietor might turn this characteristic of alcohol to his pecuniary advantage by adding a few gallons of water to each barrel of fuel does not make this any less an advantage. Alcohol has the well-known advantage of being easily distilled from almost any vegetable matter, good or bad, and can be produced very cheaply if a market for it should open.

Very little extra heat is required in using alcohol in a motor, in fact, at ordinary temperatures a motor will start on alcohol provided the piping between carburetter and motor is not so long that the vapor can condense before getting into the cylinders. Gasolene motors seem to thrive on alcohol, given good carburation, and there is another point for alcohol—it burns clean, without odor, and leaves no sooty deposit. And it will stand considerably higher compression than gasolene before pre-igniting.

A few years ago, about the time alcohol was placed on the free list, a carburetter was devised which took advantage of the fact that commercial alcohol always contains water. Between the spray nozzle and the intake pipe was a chamber containing calcium carbide, through which the sprayed alcohol passed. The water in the alcohol, acting on the carbide, caused the production of a small quantity of acetylene gas, which, mingling with the spray, went into the cylinder. The resulting gas proved to have decidedly interesting characteristics. It produced a more powerful explosion than gasolene, or than alcohol alone, and it was readily ignited. The decomposition of the carbide produced a certain amount of heat which assisted materially in the vaporizing process, and this, together with the admixture of acetylene, made starting easy. Though considerable experimenting was done with this system, it seems to have been abandoned—perhaps to await the coming of the “alcohol era.”

There still remain the heavier fuels—crude hydrocarbons that have the advantage of being extremely cheap. This is about the only “talking point” they possess, however, for they are extremely difficult to vaporize—which brings out the fact that they are in the “safe” class—and are objectionable both to the eye and to the nose, and are objectionable both before and after combustion. Heavy fuels are not

suited to light, high-speed motors, for they are comparatively slow in action and it is difficult to avoid deposits of solid matter in motors of the automobile type. In short, the field of the heavy oil motor apparently is the stationary field, where large units are used and where economical operation can be aimed at without much consideration of such factors as weight and bulk.

Of all the fuels in sight, alcohol is considered the most likely successor of gasoline. In fact, it is in very common use for small stationary engines abroad, where alcohol is cheap and gasoline very dear, and from these small prime movers to automobile motors is but a short step, from a fuel point of view.

But however interesting speculation as to the future may be, for the present, "gasoline is king."

The fact that some of the motor starters now on the market are so made that they are capable of keeping a motor running for some time on acetylene suggests possibilities in connection with the use of alcohol, and possibly of kerosene, as a fuel. A motor with a gas starter, perhaps constructed especially for the purpose, could be run on acetylene until thoroughly warmed up before turning on the liquid fuel, thus avoiding the necessity for carrying an extra tank containing gasoline. There would seem no particular objection to such a system, excepting possibly the expense of running on acetylene; but this need not be a serious matter, especially if provision were made for stopping the circulation of the cooling water until the cylinders became hot. Once hot, the motor could be started readily on its regular fuel, even after a short stop. Sufficient heat for running on alcohol would be generated in a very few revolutions, and though kerosene requires a great deal more warmth, it would be only a question of running for a short time longer to take care of the heavier fuel.

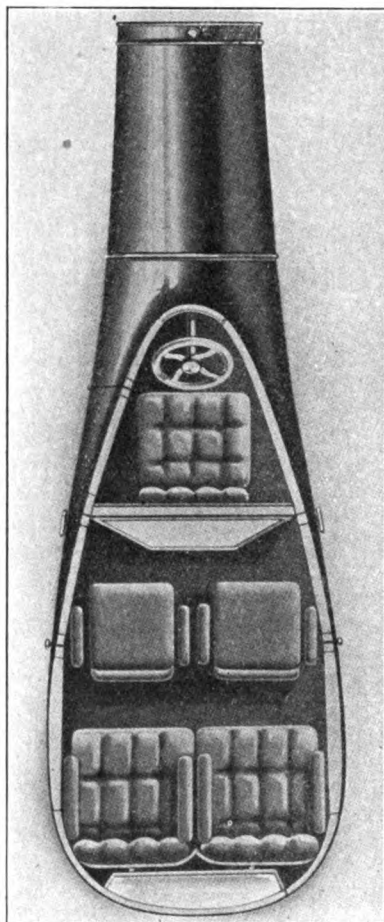
Queer Provision of Taxicab Franchise.

Taxicab transportation for policemen on duty or off duty—without a cent of cost to themselves or to the city—is one of the provisions of a concession which has been granted to Francisco Arias, Sr., of Panama, for the establishment of a taxicab service in the cities of Colon and Panama. According to the report of Consul-General Synder, Senor Arias intends to run motor taxicabs in the Canal Zone, wherever highway conditions will permit, as well as motor buses accommodating eight persons; but before the government would grant him a concession he had to agree to transport mail from government postoffices along the route, and to give policemen free transportation on the cabs. He agreed furthermore to have at least six taxicabs in operation within a year; this number to be increased to 25 before the expiration of three years. A motor truck service also is scheduled.

GERMANS DEVELOP NEW BODY

Affords Single Seat for Driver and Clear View for Passengers—Smooth Blending of Hood and Dash.

It was abroad that the so-called streamline body first had its inception and since its advent the production of outre bodies had suffered little if any diminution. Their design and construction has served as a source of almost unending effort on the



WINDHOFF NOVEL BODY DESIGN

part of French and German builders in particular, and though some of the bodies which have been produced reveal little of the real reason for their awe-inspiring aspects, the Windhoff car, a top view of which is shown herewith, possesses several features which are as novel as they are of practical value.

Perhaps the most noticeable feature of the body, barring its general outline which follows very closely the rules which have been laid down for the reduction of wind pressure, is the arrangement of the steering wheel and the driver's seat in the center, entrance being through a small flush door at the left side. The object of the arrangement very evidently is to permit the occupants of the rear seats a clear view of the road ahead, though it is logical also for the reason that a passenger seldom is carried in the driver's compart-

ment of a limousine. The principal advantage of the arrangement, however, is that it permits the blending of hood and dash and sides to a nicety which is in marked contrast to the abrupt angles and unsightly projections which usually mar an otherwise smooth and pleasing exterior.

With a view to obtaining for the occupants of the seats in the rear compartment the greatest possible comfort deeply upholstered arm chairs are substituted for the usual single wide seat. Similarly, the auxiliary seats also are arm chairs in effect and are arranged to swivel in order to facilitate entrance and exit, the doors, which are two in number, being located forward of them. Though the body gives the effect of being built on an unusually long wheelbase such is not the case, the measurement being 130 inches. Despite this fact, however, there is rather more room than usual between the seats.

Both chassis and body are the product of the German firm of Gebrüder Windhoff of Rheine. The motor is of the six-cylinder type with the cylinders cast en bloc and the valve mechanism fully enclosed, and though the bore and stroke are 3½ inches and 5½ inches, respectively, the rated horsepower is 15-40. One of the noteworthy features of the power plant is that both motor and change gear mechanism may be removed intact from the chassis without the necessity for disturbing other parts or altering their adjustment.

About Sulphation of Storage Batteries.

It has been often said that to prevent sulphation of storage battery plates it is necessary to keep the cells fully charged. This, however, is not quite true, for if a battery be left in a fully charged state for a considerable length of time, and the plates then are examined, it will be found that they have become sulphated just as surely as if the battery had been left without a charge having been first introduced. The deposit however, in the case of fully charged cells is much more gradual than with the discharged cells. It naturally follows that batteries which are only partially discharged and then are recharged, the cycle being continued for some time, are just as likely to become sulphated as those which are allowed to stand in a discharged state. The sulphate however, forms more slowly, and instead of being deposited on the surface of the plates, forms between the active material and the lead proper. A cross section of a plate so sulphated reveals an area of active material, an area of sulphated material, and the lead grid. This sulphation increases the internal resistance of the battery, and greatly decreases its capacity at the same time tending to cause the flaking of the active material. The proper working conditions for the elimination of sulphation in a storage battery are reached only when the service allows of a full discharge before the commencement of the recharge.

NEW FRENCH BUSES FOR NEW YORK

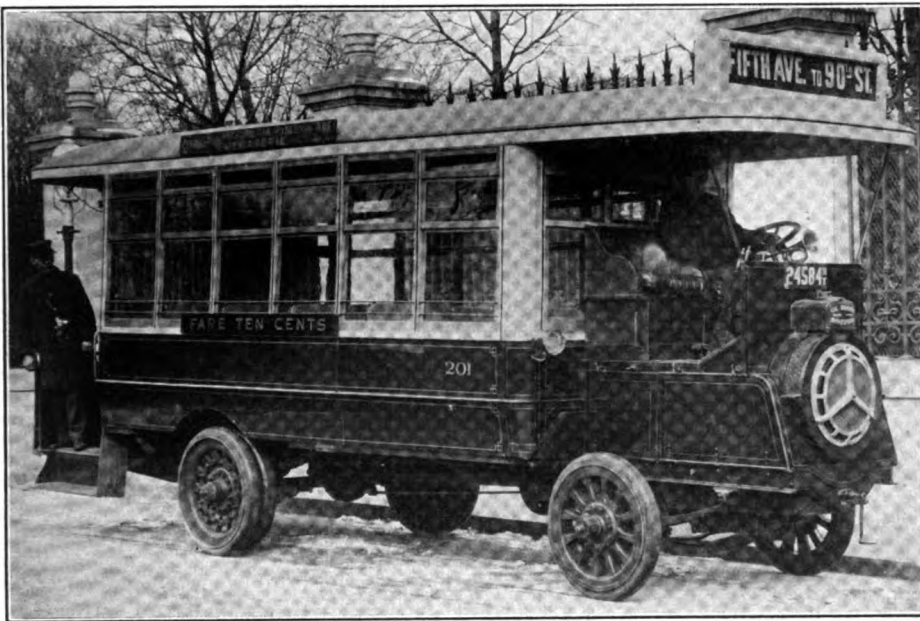
Type Which Has Found Favor in Paris
Introduced Here—May Mark End of
"Double-Deckers."

After several years of "double deckers," there is now in use on Fifth avenue, a brand new motor omnibus which is a radical departure from anything that New Yorkers who stay at home ever have rid-

The passenger capacity of the new bus, not counting the driver and the conductor, is 31 persons. Of these, 24 are accommodated inside two on a seat in two rows, facing forward, with an aisle 16 inches in width between them. The remaining seven are carried on the rear platform and it is a tribute to the smoothness of action of the vehicle that six are permitted to stand; a small folding seat serves for the seventh. The wheelbase of the bus is 13 feet 9½ inches, and the length of the body is 18

feet eight inches, to permit of the maximum degree of elasticity without danger of permanent set, and mounts the familiar De Dion four-cylinder motor. The cylinders measure 4¼ x 6 inches, bore and stroke, respectively, and the rated horsepower at 1,000 revolutions a minute is 35. Thermo-siphonic action is relied upon for cooling and not the least of the distinctive features of the new bus is the radiator which is used. It is styled a "centrifugal" radiator by its manufacturers, the designation serving to indicate that the draft is forced through the tubes laterally by means of a centrifugal fan. The tubes themselves are arranged by means of a centrifugal fan. The tubes themselves are arranged in two semi-circular batteries connected at their ends by means of key-stone-shaped collector boxes, or headers. The delivery to the radiator is at the top, into the top header, and there is included by way of reserve a small tank over the header. The tube assembly is enclosed in a metal case which also serves to attach the radiator to the chassis frame. A three-pronged outside "spider" serves to protect the radiator and also to help support the fan which is arranged in the center, concentrically with the tubes. One of the noteworthy features of the arrangement is that owing to the absence of a draft through the radiator from front to back, dust and dirt is not drawn in to be distributed over the engine. Ignition is by Bosch high tension magneto.

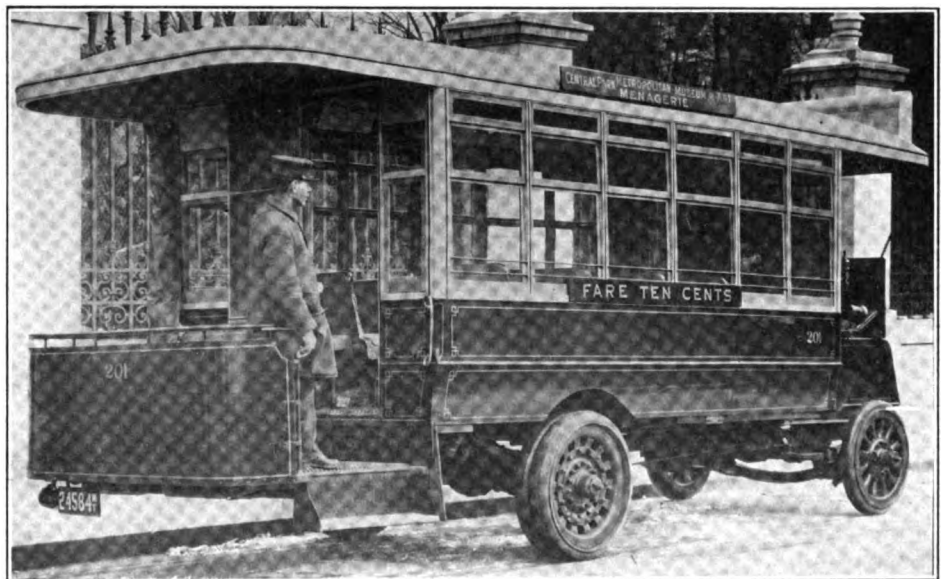
In attacking the carburation problem,



FIFTH AVENUE COACH CO.'S NEW DE DION SINGLE-DECK BUS

den in before. It has been placed in operation by the Fifth Avenue Coach Co., and is like the others in only one respect, viz., it is of De Dion manufacture. Otherwise it has not a single feature in common with the old type atop of which New Yorkers have clambered in the past. It is identical with 300 which the Compagnie Generale des Omnibus has in operation on the streets of Paris, and which during extended service have proven their serviceability and efficiency.

In the first place the new bus which is shown by the accompanying illustration, has no upper deck and though its seating capacity therefore is slightly less than is that of the older type, it has been demonstrated during the short time it has been in operation that the actual number of passengers carried is greater. This is explained of course by the fact that the inside seating capacity is greater for there are few who care to brave the rigors of the winter climate unprotected on top of the old buses. It is expected that the new bus will show the same popularity during the summer months for the reason that when "opened out" there is considerably less between the passengers and the outer atmosphere than there is in the older buses whose inside seats never have been crowded after the chill has disappeared from the air.



REAR VIEW SHOWING SEATING ARRANGEMENT AND WIDE PLATFORM

feet eight inches, the overall length of the whole being 24 feet. The width of the body, which is extreme, is 80 inches and necessitates the addition of special platforms riveted to each side of the chassis frame. The weight of the vehicle complete, with passengers is approximately 15,000 pounds.

The chassis itself is of extra heavy chan-

nel section steel, to permit of the maximum degree of elasticity without danger of permanent set, and mounts the familiar De Dion four-cylinder motor. The cylinders measure 4¼ x 6 inches, bore and stroke, respectively, and the rated horsepower at 1,000 revolutions a minute is 35. Thermo-siphonic action is relied upon for cooling and not the least of the distinctive features of the new bus is the radiator which is used. It is styled a "centrifugal" radiator by its manufacturers, the designation serving to indicate that the draft is forced through the tubes laterally by means of a centrifugal fan. The tubes themselves are arranged by means of a centrifugal fan. The tubes themselves are arranged in two semi-circular batteries connected at their ends by means of key-stone-shaped collector boxes, or headers. The delivery to the radiator is at the top, into the top header, and there is included by way of reserve a small tank over the header. The tube assembly is enclosed in a metal case which also serves to attach the radiator to the chassis frame. A three-pronged outside "spider" serves to protect the radiator and also to help support the fan which is arranged in the center, concentrically with the tubes. One of the noteworthy features of the arrangement is that owing to the absence of a draft through the radiator from front to back, dust and dirt is not drawn in to be distributed over the engine. Ignition is by Bosch high tension magneto.

two, it is not always available, and it is inexpedient to change carburettors. The bus consumes one gallon of gasoline in every 10 miles of travel. By means of a centrifugal governor which operates a butterfly valve in the intake pipe, the maximum speed of the bus is held down to about 12 miles an hour.

In regard to the transmission elements, there is little that differs from the standard practice evidenced in the older De Dion Fifth avenue buses. The clutch is of the familiar three-plate De Dion type, operating without lubrication, and the change gear mechanism permits three speeds forward and one reverse, selectively obtained. The final drive is by cardan shafts of the usual patented De Dion construction. Both sets of brakes are of the expanding type, the emergency brake being located on the rear wheels, operated by a hand lever, and the service brake on the propeller shaft between the change-gear mechanism and the differential; it is interconnected with the clutch pedal. The bus is equipped with United States solid tires, those in the front being 34 x 4, and those in the rear twin 36 x 5.

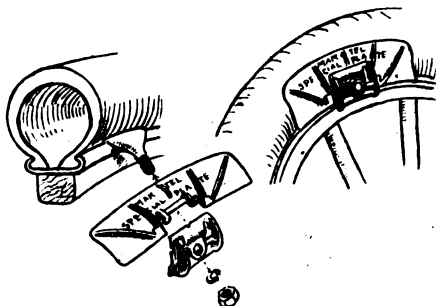
The motor is arranged under the driver's seat, which is considerably higher than it is in the older vehicles, and the steering wheel is located at the left with the gear shift and emergency brake levers in the center of the footboard. Though the new bus is largely in the nature of an experiment it is expected that by reason of the mechanical efficiency which it has shown, others of the same type soon will be plying on Fifth avenue. They will be in addition to the older buses which will be kept in service, though it is unlikely that the fleet of "double-deckers" will be increased.

Where Some of the Rubber Comes From.

Not all the rubber of which American automobile tires are made comes from more or less obscure South American republics or other foreign parts. A part of it, at least, comes from very much nearer home, the exact location being the State of Texas. Over the thousands of acres of State lands wild guayule rubber shrubs grow luxuriantly. No attempt at cultivation is made and every once in so often the State Land Commissioner knocks the whole lot down to the highest bidder. The next sale is due to take place some time in March, bids being receivable in Austin up to March 14th. The State Land Department made the first sale of the guayule shrub upon State lands five years ago at which time the total consideration obtained amounted to \$61,000. The shrub which was gathered under the terms of the sale was used in a rubber manufacturing plant at Marathon, Tex., and was turned into crude guayule rubber and shipped to New York to be converted into tires and other rubber commodities which are not so intimately connected with an automobile.

Metal Plate to Prevent Blow-Outs.

While the market affords scores of different makes of tire "blow-out" boots and patches made of leather or of rubber and fabric combinations, the Martel protector, which is shown by the accompanying illustration, is a decided novelty in that it is made wholly of metal. The Martel protector which is made by the Martel Blow-Out Protector Co., of 338 West 63rd street, Chicago, is guaranteed to hold any blow-out that can be covered with half an inch



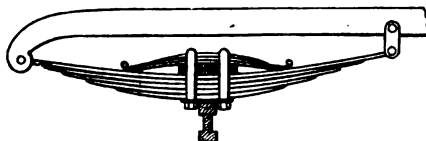
MARTEL BLOW-OUT PLATE

overlap, no inside patch being necessary unless a piece of the tire has been blown out bodily.

The device consists of a metal plate, which actually does the "protecting," a lug which hooks on the rim and has its outer end threaded to receive a nut, and a smaller plate which acts as a retaining piece for the main plate. In applying the protector the lug is hooked on opposite the center of the blow-out, the main plate placed in position so as to cover the damaged spot, and the small plate slipped over the threaded lug and the nut screwed home, a spring lock-washer preventing the working off of the nut. The fastenings are so designed that if the tire softens the plate can follow it, keeping the blow-out protected at all times. This "special plate," as it is called, is of course intended for side blow-outs, and the maker claims that it can be put on in a minute and a half. The concern also makes protectors of the "boot" type with rubber-and-fabric bodies.

Ames's Idea of Shock Absorbers.

Working on the theory that the proper way to check the violent rebound of a



AMES SHOCK ABSORBER

spring is to oppose to it another spring, a shock absorber has been brought out by O. B. Ames, of Brewster, N. Y., that is so simple that no lengthy description of its construction is required; the accompanying illustration tells the story. The Ames shock absorber is nothing more than a miniature leaf spring clipped over the main spring in an inverted position, the ends of the

shock absorbing spring resting on the top leaf of the main spring somewhat less than half way between the center and the shackles. The thin, flexible ends of the main springs are perfectly free to play under ordinary road conditions, and there is no tendency to stiffness; but in case of a violent rebound which brings the heavier portions of the springs into action, the resistance of the auxiliary springs checks the upward throw. No adjustment is required and no provision is made for it; when the proper equipment has been applied it becomes a permanent part of the car and needs no more attention than the main springs—not as much, in fact, for there are no shackle bolts to keep an eye on. The Ames shock absorbers are made in three sizes, suitable for cars of various weights.

Rubber Hose That Deteriorates.

It is an odd fact that the radiator of the highest priced motor car is coupled to the cooling jacket by the same type of connector as that employed on the cheapest runabout and the connector is the same sort of rubber hose used by the makers of water-cooled cars 15 years ago.

Rubber deteriorates rapidly under the effects of great variation of temperature. Oil, gasoline, in fact any of the liquid constituents of crude petroleum soften and dissolve it. For obvious reasons the utilization of rubber for any purpose whatsoever under the engine hood, is not what might be considered a laudable practice, to put it mildly. When however, the rubber in the form of a hose is subject to the variations of temperature due to non-operation and prolonged runs, the cutting effects of a combination of street grime, oil and gasoline which are wont to attack the tubing from the outside, and the like variations in the temperature of the liquid it is destined to carry, the composition of which varies according to neighborhood and weather conditions and from pure water to water impregnated with alcohol, it is remarkable that the cooling system is not often clogged by kinks in the softened couplings or the accumulation of peelings from their interior.

The substitution of flexible metal hose equipped with unions for attaching to the jacket and radiator inlets and outlets, for the rubber couplers now used would eliminate not a little of the cooling trouble now experienced, and at the same time facilitate the removal of radiator or cylinders. The lack of elasticity in the tubing could be compensated for by crooking the hose, placing the tubes connected at right angles to each other.

Vibrating Rods That Cause Buzzing.

Occasionally when a persistent buzzing or groaning apparently emanates from the rear axle it may be stopped by staying the radius rods so as to prevent them from vibrating. Often it is merely the vibration of the rods which causes such noises.

AUTOMATIC IGNITION TIMING; ITS ADVANTAGES

The Theory That Is Involved and the Necessity for Automatically Varied Spark Control—The Relative Inaccuracy of Manual Control as Compared with Automatic Timing and the Results Which May Be Expected to Accrue, Explained by an Expert.

Though there are many factors which bear directly on the efficiency of any internal combustion engine, it is doubtful if there is any which is of greater importance than that the spark be timed correctly. Theoretically, if the greatest power is to be developed it is essential that the explosion within the cylinders take place when the combustion spaces are the smallest, or, in other words, when the pistons are at their highest points. But there are other factors which must be considered in this respect, and the principal one is the lag which takes place between the occurrence of the spark and the actual explosion of the charge in the cylinders. It was to this particular factor that Lon R. Smith, who is the Eisemann Magneto Co.'s ignition expert, drew attention in a paper which he read before the meeting of the Society of Automobile Engineers. The paper is entitled "Automatic Spark Control," and in it is set forth in an exceptionally clear manner the theory of magneto ignition.

"When the spark occurs in the cylinder," he said, following a general introductory in which he reviewed the history of ignition from the primitive hot tube method to the present-day highly efficient magneto, "the ignition of the mixture begins; if the cylinder is a very small one and the spark is produced about in the middle of the combustion chamber, there is but an inappreciable time between the beginning and the end of combustion, for the flame then spreads out in all directions from the center, instead of having to start from one side and travel all the way across the combustion chamber. As the cylinder proportions grow, and the spark points are located further from the center of the chamber, making the distance for the flame to spread greater, the time required for completely burning the mixture grows longer. If in a large cylinder the spark were produced at the dead center of the compression stroke, the piston would be started well on its downward stroke before combustion would be complete, causing considerable loss of power and overheating the motor. The size of the combustion chamber and the density of the explosive mixture, are, therefore, two of the important factors deciding the timing of the spark of any motor. These conditions can, of course, be foreseen, and the exact setting for each type of engine could be arrived at by calculation were it not necessary to include also the third and greatest

factor which enters into the case—the speed of the motor.

"If we found in the case of cylinder C (Fig. 1) that according to dimensions and compression it would take a certain amount of time to ignite fully the contents of the combustion chamber (X-A), and we wanted the completion of combustion to occur at dead center (X), we would have to set the spark in advance of the dead center position by an amount equivalent to the travel of the piston (at a given speed) during the time required for complete combustion. Thus at, say, 500 R. P. M., taking X for the dead center, this distance would have to be X-Y and the spark would occur at Y on the compression stroke to secure

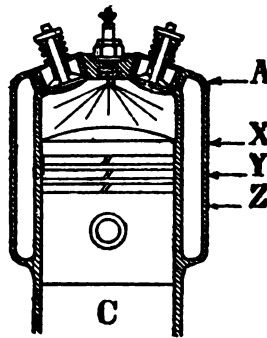


FIG. 1

the full pressure of complete combustion at dead center X. If we fixed the spark to occur at Y and increased the speed to 1,000 R. P. M. the piston would go to X and return to Y on the power stroke before combustion would be complete. This would result in considerable loss of power during the piston's travel between the points X and Y, the full force of the explosion not being exerted on the piston until the latter point is reached. To overcome this it is necessary to recalculate the piston speed at 1,000 R. P. M. and set the spark at a point, say, Z, which will allow of complete combustion when the piston has reached X on the compression stroke.

As the speeds of an engine vary greatly, according to various requirements, it would be necessary in order to get the most power and use of the least fuel, for each speed, to calculate the correct timing of the spark for each 10 R. P. M. between the maximum and minimum. It is this important function, almost the greatest factor in the efficiency of an engine, that has until now been left to the rule of thumb of the chauffeur. Even were the average man capable

of calculating this it would be impossible in practice to set the spark according to the results obtained. No one can tell from its sound whether a motor is running 500 or 550 R. P. M., and yet it would be necessary to make much finer distinctions to secure proper use of spark control. It is for this reason that automatic spark control has been desired.

"The Eisemann spark control mechanism is operated automatically by means of a centrifugal governor. This governor is embodied in the magneto, is completely encased, and dips in an oil well. Immediately the armature rotates the weights fly out gradually as the number of revolutions increase. The armature shaft drives the armature through two helocoidal keys cut in the shaft, and moving in corresponding key-ways in a square boss which slides in a two-faced guide fixed to the armature proper. To the square boss are pivoted two arms of the respective weights—the two other arms being fixed to the guide according to the throw of the weights so that the armature is shifted in its relative position to the driving shaft. This method of timing offers the great advantage of the spark taking place in exact proportion to the number of revolutions; the spark always jumping across the plugs at the moment of greatest current intensity.

"At full retard a strong spark is produced at once and there is no difficulty in getting the motor started; a short sudden pull of the starting-crank is sufficient. This makes expensive starting devices superfluous on all motors. The greatest thing claimed for the fixed spark used by some motor car makers is its simplicity and almost fool-proofness. With the automatic spark control there are all the advantages of the fixed spark and, in addition, the great advantage of a correct spark position for all speeds, which saves fuel and protects the motor from undue shocks caused by early ignition.

"Special attention is drawn to the fact that in the construction of the automatic control the up and down advance mechanism known as manual control is done away with entirely. With the up and down advance mechanism the spark is strongest and most efficient when the timing lever is at full advance, and the spark is weaker and weaker as the lever is retarded. With the automatic control magneto, on the contrary, the spark is always the same at all positions. A further advantage is that the range of the timing may be increased 100

per cent. as compared with the up and down advance. . . .

"When designing the automatic spark control, through the courtesy of about 20 manufacturers, data were secured giving the correct amount of advance and retard for every conceivable condition of operation. Curves were then drawn representing the experience of each manufacturer and these were merged into the ideal curve. Then a method was sought to obtain this curve automatically. A diagram (Fig. 2) shows the advance curve at increasing motor speeds (four cylinder motor). The advance movement is shown from 10 degrees retard to 40 degrees advance. The diagram also shows revolutions per minute from zero to 1,200. The horizontal line running through the diagram represents

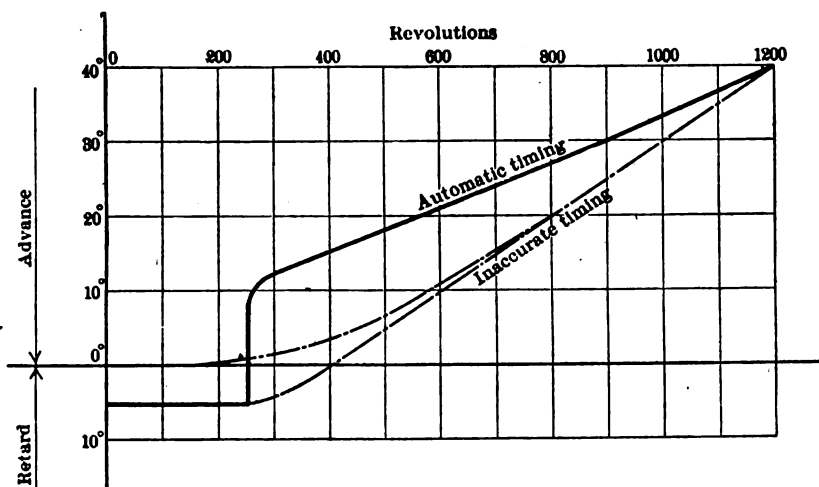


FIG. 2. SHOWING RELATIVE INACCURACY OF HAND TIMING

the upper dead center of the piston travel, with the piston on the dead center, a key, which is furnished with each magneto, is inserted in a slot provided for it. The magneto is so constructed that when the key is thus inserted the points on the make and break mechanism are just on the breaking point. With a standard 38-degree advance spindle and a No. 5 spring there will be no advance movement until a speed of 250 R. P. M. is reached. At this speed an instantaneous advance of 12 to 15 degrees takes place. From 250 R. P. M. up to 1,200 R. P. M. the advance is gradual, as shown by the diagram.

The automatic advance magneto is of the same construction as the standard high-tension instrument with the addition of the automatic mechanism. The automatic advance is accomplished by the action of centrifugal force on a pair of weights (A) attached at one end to a sleeve (B) through which runs the shaft (C) of the magneto and hinged at the other end of the armature. Along the armature shaft run two helicoidal ridges which engage with similarly shaped splines in the sleeve. When the armature is rotated the weights begin to spread and exert a longitudinal pull on the sleeve—which in turn changes the position of the armature with reference to the

pole pieces. In this way the moment of greatest induction is advanced or retarded, and with it the break in the primary circuit. For the segments (or cams) which lift the circuit breaker and cause the break in the primary circuit are fixed in the correct position, and thus the break occurs only at the moment when the current in the winding is strongest. (On other magnetos it is the segments or cams that are moved forward or back as the case may be.) As there is only one actually correct position for the segments every degree away from this must weaken the spark.

"To apply the automatic control principle to any motor there have been produced advance spindles of varying pitches; spindles that will give 19, 25, 38, 45 and 60 degrees advance. For use in connection with

mechanism or to measure the gap between the armature and pole pieces, a feature greatly appreciated by anyone who has timed a magneto. Moreover, the key also holds the driving axle fast and the actual driving medium can be set properly and held securely without any chance of the axle shifting.

"In hill climbing the engine, of course, loses some of its momentum and slows down somewhat in spite of a full supply of gas. The magneto retards itself proportionately, and owing to the mode of advance, as mentioned before, ignites the full charge with the same spark as if advanced. Full combustion at the right moment, with the resultant power, is assured and does away with considerable gear changing, which is often made necessary by wrong setting of the spark. Another advantage in hill climbing, or any hard pull, is the absence of any spark knock. With the ordinary advance it is necessary to retard the spark to prevent motor from pounding; as soon as it is retarded you lose power.

"When a car is on the road there are many changes in conditions which affect the motor and are not noticeable to any of the five senses of the driver. In one case it may be a slight grade; in another a sandy road, or a slightly increased or decreased speed. Even were the senses acute enough to notice these differences, it would be impossible for the operator to change the advance enough, but not too much, to meet the theoretical and practical requirements. And yet to get the perfect result such change is indispensable. There is no question but that the correct timing of the spark is greatly to be desired."

Using Kerosene to Remove Rust.

Kerosene is of great value as a rust remover—or rather as a softener of rust—but in four cases out of five it is not given sufficient time to do its work. Kerosene splashed on and immediately rubbed off will do practically no good; it must be given time to penetrate, the longer the better. Several hours at least ought to be allowed, and if the rust is heavy, all day or all night, or both, will be found necessary to give the oil an opportunity to do what it is capable of doing. The same principle applies, of course, in cases where kerosene is applied to a nut rusted on a bolt or stud, only in this case the oil has to penetrate between the metal faces in addition to permeating the film of rust.

The Cutting of Asbestos Gaskets.

If the central hole in an asbestos gasket is cut exactly the size of the opening in the pipe or port, the soft asbestos probably will extend somewhat into the passage when compressed, and to some extent obstruct the opening; also it will very likely crumble and flake off and possibly make trouble in this way. The gasket opening should be a trifle larger than the passage—say about on eighth of an inch.

Flanders Electrics

SPECIAL TO DEALERS

WE ARE NOW DELIVERING the Flanders Colonial Electric in quantities. You know what a hit this car made when first announced—the enthusiasm increases daily and is multiplied in each city as cars go into service.

WE HAVE PASSED THRU our “teething troubles”—gotten all the bugs out of her—and we can say this car developed fewer defects than any other new model we have ever known. And our experience covers a wide range.

WEIGHT OF THE FINISHED CAR was slightly more than that of the experimental model so efficiency was not fully up to specifications.

WE ADDED SIX CELLS of batteries—making 30 instead of 24. That was the only change made or needed. Isn't that a record.

MOTOR IS 100 PER CENT. GOOD - perfect.

WORM DRIVE has shown up so wonderfully in efficiency as well as in silence and other qualities, it has conquered all prejudice. Already several other makers are planning to adopt the worm drive for next season - you'll find it in all first class electrics.

IN APPEARANCE—well, you know the Flanders has become the standard by which all others are judged.

OUR DEALERS ARE THE LIVEST ones in their respective cities. Most all the territory is closed. But a few good towns and cities are still open. Is yours one? If so, you'd better get in touch before some other live dealer secures this plum.

SOMEONE is going to make a lot of money selling Flanders Electrics in your town.

Price \$1775

FLANDERS MANUFACTURING COMPANY, Pontiac, Mich.



999,528. Nut Lock. John H. Skelton, Bayonne, N. J. Filed May 12, 1910. Serial No. 560,937.

1. The combination with a nut having a recess formed in its underside concentric with the bore, of a split threaded washer seated in and thicker than the depth of the recess having its bore concentric and registering with the bore of the nut.

999,565. Vibrator for Induction Coils. Edward P. Jacobson, Pittsfield, Mass., assignor to Jacobson-Brandow Co., Pittsfield, Mass., a Corporation of Massachusetts. Filed Aug. 31, 1910. Serial No. 579,944.

1. In an induction coil, a vibrator comprising a vibratile element fixed at one end and having a contact member on its free end, a bridge extending over the free end of the vibratile element and having a contact member thereon normally engaged by said other contact member, said bridge being fixed at one end and normally movable at its opposite end, means for raising or lowering the movable end of the bridge for the relative adjustment of said contact members whereby the consumption of elec-

tric current by said coil cannot exceed a predetermined maximum amount.

999,570. Roller Bearing. Benjamin S. Lawson, Brooklyn, N. Y., assignor to Asa L. Merrick, Syracuse, N. Y. Filed Mar. 10, 1910. Serial No. 548,346.

1. In a journal bearing of the class specified, the combination with a cylindrical axle and an axle box; of a series of rollers interposed between said parts, each roller being provided with a central cylindrical portion and with tapered end sections, the rollers being of a length substantially equal to the interior length of the box, and bearing upon faces formed upon the interior of the box complementary in form to the outline of the rollers.



INDEX TO ADVERTISERS



A		H		O	
Abbott Motor Co.	866	Hartford Suspension Co.	855	Owen, R. M., & Co.	855
Ajax-Grieb Rubber Co.	859	Havers Motor Car Co.	860	P	
American Ball Bearing Co.	862	Haynes Automobile Co.	865	Packard Electric Co.	867
American Motors Co.	864	Henderson Motor Sales Co.	866	Parish & Bingham Co.	863
American Starter & Carburetor Mfg. Co.	863	Hot-Spark Plug Co.	862	Parish Mfg. Co.	855
Argo Electric Vehicle Co.	858	Hupp Motor Car Co.	863	Penn Spring Works	855
Atwater-Kent Mfg. Co.	812	Hyatt Roller Bearing Co.	860	Perfection Spring Co.	856
Automobile Supply Mfg. Co.	860	I		Petrel Motor Car Co.	863
B		Inner Shoe Tire Co.	855	Pullman Motor Car Co.	863
Badger Brass Mfg. Co.	F. C.	International Accessories Corp.	816	R	
Barthel, Daly & Miller	863	Inter-State Automobile Co.	860	R. C. H. Corporation	864
Bartholomew Co.	866	J		Remy Electric Co.	859
Benz Auto Import Co.	853	Jackson Automobile Co.	861	Royal Equipment Co.	862
Bosch Magneto Co.	858	Jamestown Wheel & Mfg. Co.	856	S	
Bossert Co.	862	Jeffery-DeWitt Co.	867	Sackman Mfg. Co.	867
Bower Roller Bearing Co.	862	Jeffery, Thomas B., Co.	865	Safety Tire Gauge Co.	856
Briggs-Detroit Co.	863	Johns-Manville Co., H. W.	867	Salisbury Wheel & Mfg. Co.	814
Brown-Lipe Gear Chapin Co.	861	Jones, Phineas, & Co.	867	Schrader's Son, A., Inc.	814
Bush Mfg. Co.	855	Jones Speedometer	861	Selden Motor Vehicle Co.	863
C		K		Shawmut Tire Co.	858
Cartercar Co.	865	Kellom, Chas. F., Co.	856	Sparks-Withington Co.	859
Century Electric Car Co.	862	Kelly-Springfield Tire Co.	817	Speedwell Motor Car Co.	865
Champion Ignition Co.	858	Kinsey Mfg. Co.	816	Splittorf, C. F.	818
Champion Spark Plug Co.	867	Kissel Motor Car Co.	860	Springfield Metal Body Co.	856
Clark-Carter Automobile Co.	857	Kline Motor Car Corp.	868	Standard Roller Bearing Co.	856
Classified Advertising	854-55	Knox Automobile Co.	857	Standard Oil Co.	857
Colby Motor Car Co.	866	L		Standard Tire Protector Co.	855
Colonial Electric Car Co.	866	Lauth-Juergens Motor Car Co.	807	Standard Welding Co.	819
Continental Motor Mfg. Co.	855	Leather Tire Goods Co.	855	Stearns, F. B., Co.	865
Corbin Motor Vehicle Co.	866	Locomobile Company	855	Stewart & Clark Mfg. Co.	810
Covert Motor Vehicle Co.	864	Lovell-McConnell Mfg. Co.	Inside B. C.	Stromberg Motor Devices Co.	809
Cramp, Wm. & Sons, Ship & Engine Building Co.	861	M		Studebaker Corp.	811
Crosby Company	864	McGraw Tire & Rubber Co.	815	T	
D		McIntyre, W. H., Co.	863	Thomas, E. R., Motor Car Co.	855
Dayton Rubber Mfg. Co.	855	Mais Motor Truck Co.	863	Timken Detroit Axle Co.	813
Dean Electric Co.	808	Manhattan Electrical Supply Co.	859	U	
Diamond Chain & Mfg. Co.	861	Marion Sales Co.	866	Union Sales Co.	863
Diamond Rubber Co.	857	Mayo Radiator Co.	807	United Rim Co.	860
E		Metz Co.	866	U. S. Auto Horn Co.	862
Electric Welding Products Co.	864	Michelin Tire Co.	861	United States Tire Co.	Inside Cover-805
Empire Tire Co.	864	Michigan Buggy Co.	864	V	
F		Michigan Crank Shaft Co.	855	Velie Motor Vehicle Co.	860
Fedders Mfg. Wks.	818	Miller, Chas. E.	817	W	
F. I. A. T.	858	Mosler, A. R., & Co.	855	Warner Gear Co.	861
Firestone Tire & Rubber Co.	867	Moss Photo Engraving Co.	857	Warner Instrument Co.	818
Fisk Rubber Co.	855	Mosse, Rudolf	858	Weed Chain Tire Grip Co.	856
Flanders Mfg. Co.	851	Motor Car Equipment Co.	856	Western Motor Co.	857
Ford Motor Co.	806	Mott Wheel Works	868	Wetherill Finished Castings Co.	868
G		Motz Tire & Rubber Co.	855	Willard Storage Battery	855
Goodyear Tire & Rubber Co.	856	N		Willys-Garford Sales Co.	B. C.
Gray & Davis	867	National Motor Vehicle Co.	865	Willys-Overland Co.	820
Grossman, Emil, Co.	861	Nordyke & Marmon	865	Winton Motor Car Co.	860
		Not-A-Crank Gas Engine Starter Co.	862	Wisconsin Motor Mfg. Co.	865

999,590. Combination Pump and Shock Absorber. Frank C. Priestly, Los Angeles, Cal. Filed Jan. 3, 1910. Serial No. 536,243.

1. The combination with a vehicle axle and frame, a pump cylinder, a reservoir, outlet connections from the respective ends of the pump cylinder to the reservoir, an outwardly opening check valve in each of said outlet connections, an inlet connection from the outer air to the pump cylinder at points between the outlet connections and the center of the cylinder, an inwardly opening check valve in one of said inlet connections, a piston mounted to move in the cylinder, a piston rod connected thereto, a lever pivotally mounted on the vehicle frame and having an operating connection with the axle, a bar connected to said lever, and a connection from said bar to said piston rod, the inlet connection for the cylinder at the end toward which the piston moves in the descent of the axle relatively to the frame being in continuous communication with the outer air to allow outflow of air until the piston passes over and closes said inlet connection.

999,606. Nut Lock. Claude Battey Stillwell, Savannah, Ga. Filed Nov. 8, 1910. Serial No. 591,279.

1. In a nut lock embodying a main plate having a perforation to receive in holding relation a bolt and a series of detent devices up-raised on the surface of said main plate, said devices being removed from said perforation and disposed concentric therewith, said main plate adapted to rest in non-rotative contact with the body in which said bolt is mounted; a locking plate having a perforation adapted to pass a nut, the inner wall of said plate having a plurality of recesses adapted to engage the corners of said nut, said locking plate being provided with an extended member for engagement with said detent devices on said main plate.

999,607. Wheel Hub for Automobiles and Similar Vehicles. Albert P. Stocker, Struthers, Ohio. Filed Feb. 13, 1911. Serial No. 608,280.

1. A hub of the type described comprising spoke rings, resilient straps having a star formation within said rings with the ends of said straps supported by the inner sides of said rings, inner blocks mounted upon said straps, outer plates engaging the outer sides of said blocks, anti-friction rollers carried by said inner blocks and adapted to engage said straps, means for retaining said blocks and said plates together upon said straps, and coiled compression springs mounted upon said straps between said rings and the outer sides of said blocks.

999,609. Cushion Attachment for Wheels. Roy Ulrich, Overton, Neb. Filed Jan. 25, 1911. Serial No. 604,644.

In a device of the class described, the combination with a wheel, of a two-part casing comprising substantially U-shaped members in cross section, rings connecting the separate parts of said casing, arcuate flexible guard members secured to the separate parts of the casing on opposite sides thereof by the rings, lacing members to join the free edges of said guard members, a tire removably mounted around the casing, means to resiliently hold the casing separated from the wheel, and resilient members for preventing circumferential creeping of the casing on the wheel.

999,620. Dust Protector and Packing Device for Automobiles. John K. Smith, Santa Rosa, Cal. Filed June 6, 1910. Serial No. 565,397.

1. In a carrier for automobiles, a pair of horizontally disposed bows secured to the body of the automobile and extending beyond the rear of the seat, suitable side pieces attached to and mounted between the bows at the rear thereof for forming the sides of the carrier, a double bottom in the plane of the lower bow and secured thereto, rigid connections between the bows at their rear ends, a flexible top or cover secured to the back of the upper bow, and side and front flaps on the cover adapted to be secured and unsecured, substantially as described.

999,630. Goggles. Guy B. Collier, Kinderhook, N. Y., assignor to Collier Automobile Goggle Company. Cambridge, Mass., a Corporation of Massachusetts. Filed Jan. 3, 1911. Serial No. 600,405.

1. In automobile goggles and the like, the combination of an eye-shielding shutter and means adjustably to connect said shutter to said goggles, said means having provision permitting the adjustment of said shutter into and out of predetermined operative and inoperative positions while the goggles are in their normal position on the wearer.

999,631. Windshield. Henry L. Corbin and Frederick S. Martin, Springfield, Mass. Filed Apr. 14, 1910. Serial No. 555,477.

1. The combination, in a windshield, of bars adapted to be attached to suitable supporting parts of a vehicle, supporting members articulated for backward and forward adjustment to said bars, supporting members, each having a compound bend therein, mounted on said articulated members, and a curtain frame secured to said last mentioned supporting members.

999,643. Transmission Mechanism. George W. Gerlach and Louis Edwards, Cumberland, Iowa. Filed Mar. 24, 1911. Serial No. 616,693.

1. A sliding gear transmission mechanism, embodying gear wheels, one of which is arranged to slide into and out of meshing engagement with the other in a plane axially of the gears, each of said gear wheels embodying corresponding spaced toothed portions and a connecting hub.

999,649. Rotary Engine. Thore Idzal, Camden, N. J. Filed Dec. 12, 1910. Serial No. 596,840.

1. In a rotary engine, a frame, a casing secured to said frame, a rotary piston having a plurality of annular chambers mounted for rotation within said casing, a shoe carried by said piston within each of said chambers, a hollow abutment valve arranged to reciprocate into and out of the path of each of said shoes, means for delivering steam into the interior of said abutment valve, and a slide valve carried by each abutment valve for regulating the admission of steam into said annular chamber.

999,665. Hoist. Henry L. McCay and William B. Boatright, Mathis, Tex. Filed Jan. 24, 1911. Serial No. 604,339.

1. A hoist comprising a frame, a shaft journaled transversely of the frame at one end, a reel secured to each end of the shaft, a plurality of pairs of toggle levers on the frame, the members of each pair being spaced transversely of the frame, and the pairs being spaced apart longitudinally of the frame, a bracket adjustable longitudinally of the frame at the end of each of the said levers adjacent to the shaft, each of the said levers consisting of two members hinged together at one end, one of the members being hinged at the other end to the adjacent bracket, a pair of pulleys secured to the other end of the other member, a flexible strand for each lever winding on the reel at one end, and branching at the other end, the branches passing over the pulleys and extending to a connection with the bracket to which the lever is hinged, a ratchet wheel secured to the shaft intermediate its ends, a lever having a fork, the arms of the fork being journaled on the shaft on opposite sides of the ratchet wheel, a pawl on the lever for engaging the ratchet wheel, means for preventing reverse movement of the shaft, a disk on the shaft, a strap encircling the disk, a lever pivoted to the frame and connected with the strap for tightening the same, and a seat on each of the members of the toggle levers connected to the frame.

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BARGAIN—1909 Mitchell Model L, 7-passenger, top, windshield, Presto tank and speedometer, fully equipped; in good condition and ready for use. Can give demonstration any time. Price, \$600.00. **T. H. RUSHMORE, Mineola, L. I.**

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 9

New York, February 22, 1912

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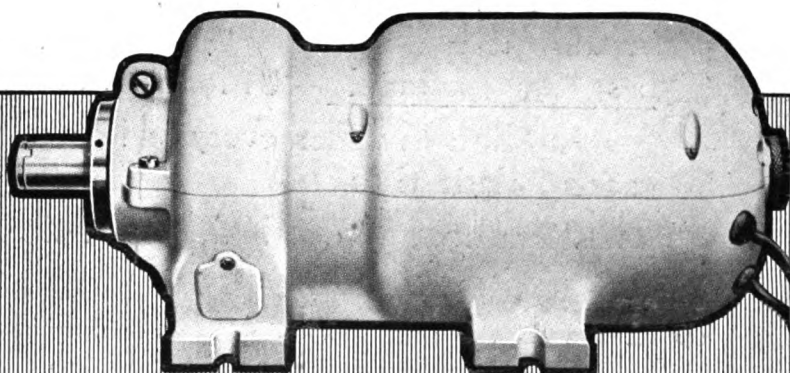
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Your standing as a dealer is determined by the service you render your customers. When a man comes into your shop you ought to be in a position to give him exactly what he wants. If you satisfy him in his smaller demands he is bound to call on you for his larger purchases.

UNITED STATES TIRE SUNDRIES

are a fine dollars-and-cents proposition for every dealer to invest in. This is a money-making line. It is a combination of the sundry stocks of four of the biggest tire concerns in the world. It is composed of only the best and most practical articles for each specific purpose.

When you handle our sundries line you have the satisfaction of knowing that you are giving your customers the best service it is possible for you to maintain. The quality of these sundries is such that by selling them you establish your reliability as a dealer.



Never Creep Tire Sleeve

No matter how much business you are doing you can't afford to overlook your sundries department. It is an important item and because it is important you should stock up with the best line obtainable — United States Tire Sundries.



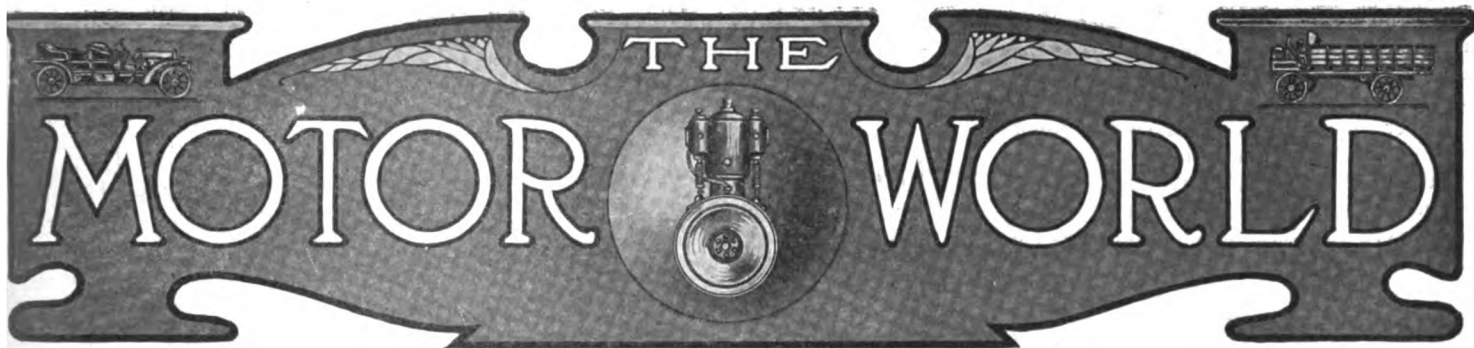
Outside Casing Sleeve

Our line includes every article motorists need in the care of their tires.

Literature and detailed information on request.

UNITED STATES TIRE COMPANY

Broadway at 58th Street, New York



IG TIRE COMPANY QUILTS RETAILING

**United States Tire Co. Voluntarily Withdraws and Leaves Fields to Its Dealers
—Twenty-Six Branches Affected.**

The United States Tire Co. this week declared itself out of the retail business, thereby voluntarily relinquishing a very considerable and very profitable trade. Formal notice of the fact is contained in an announcement which was mailed yesterday to dealers throughout the country.

The matter had been under consideration by the officers of the tire company for some time, and it finally was decided that the corporation was so big and so strong, and was selling tires to so very many dealers, that as an evidence of good faith it could well afford to relinquish retail sales to these dealers, instead of longer competing with them. When the decision was reached no time was lost in passing the good word to the retail trade. Signs, "No tires at retail," also were immediately posted in all of the United States Tire Co.'s branches.

As there are 26 of these branches scattered throughout the United States, and all of them have done a good business over the counter, some idea may be obtained of the volume of money which the tire company is turning from its coffers and into the direction of dealers who handle United States goods.

Corbin to Cease Automobile Production.

After having had the matter under consideration for a year or more, the officials of the Corbin Motor Vehicle Corporation, New Britain, Conn., finally has decided to dispose of the business and retire from automobile manufacture. Following the decision the stock of cars on hand was sold to the Corbin Garage Co., of Hartford, Conn., which is disposing of them at about one-half their catalog prices. The Corbin Motor Vehicle Corporation, which is closely allied with the huge Amer-

ican Hardware Corporation and the other Corbin interests, always has been conservatively conducted and its earnings generally were understood not to be in keeping with other branches of the business. A year or more ago it was more or less common property that if a purchaser presented himself he would have no great trouble in acquiring the Corbin automobile business. There even were reports that certain of its employes were to be given an opportunity of purchasing the plant, and it has not yet been made wholly clear that the business will not be sold to other interests and be continued in some form. As the contract with the Miner Garage Co. is said to require that the Corbin corporation maintain for a period of five years, its present repair shop and garage, with a full line of spare parts for all models, it appears certain at any rate that owners of Corbin cars will suffer no inconvenience.

United States Tire Men in New Places.

Because of the resignation of Arthur I. Philip as manager of the central district of the United States Tire Co., Joseph C. Weston, who managed the western district, with headquarters in San Francisco, is coming east to take charge of the central district, the offices of which are in Chicago. C. A. Gilbert, who has been assistant to O. S. Tweedy, eastern district manager located in New York, and who has been promoted to the management of the western district to succeed Weston, already has left for San Francisco to assume his new duties.

Warren Selects New General Manager.

Lucius E. Wilson, secretary of the Detroit Board of Commerce, has resigned that office and on April 1st will become vice-president and general manager of the Warren Motor Car Co., of Detroit, succeeding J. G. Bayerline as general manager. Although a young man, being but 33 years of age, and new to the automobile industry, Wilson has had extensive experience in executive positions, and has a wide reputation as a practical administrator of the affairs of big organizations.

SECURED PATENTS; NOT PROCESSES

Following Its Awakening, American Company Sues British Syndicate—Odd Situation Created by Valveless Tube.

When the Sealomatics Parent Syndicate of London, England, applied for a U. S. patent on its valveless, "sealomatic" inner tubes for automobile tires, it neglected—with or without intent—to say anything about the secret process, by means of which these tubes were to be manufactured, and as a result an international legal battle, which is not without amusing features, was started last week, by the filing of a suit in the United States District Court for the Southern District of New York, on behalf of the Valveless Inner Tube Co., of New York, against the Sealomatics syndicate, of London.

According to the unusually voluminous complaint, a certain William James Thorold, of London, invented an inner tube for automobile tires, which he patented in England, and the rights for which he assigned to the Sealomatics Parent Syndicate, which was formed for the purpose of exploiting the invention. Soon afterwards the Sealomatics syndicate looked for an American representative and George Wishart, of New York, entered into an agreement with the English company to push the sale of the invention in this country and in Canada. In the contract it was stipulated that Wishart should have an option on the United States patents which were to be applied for, and which subsequently were granted under No. 949,947, dated February 22, 1910, and No. 959,960, dated May 31, 1910.

While the negotiations for the patents were going on, Wishart transferred all his rights to the Valveless Inner Tube Co., for a consideration of \$1,000,000—in shares of the Valveless company. The latter concern then proceeded to install machinery and other equipment in the factory of the Walpole Rubber Co., of Walpole, Mass., and to prepare for active production of the inner

tubes. Officers of the English company visited the Walpole factory and, after declaring themselves "delighted" with the arrangements, went home, leaving with the Valveless concern the rights to the patents.

Everything would have been plain sailing thereafter, had not the Valveless Inner Tube Co. suddenly awakened to the fact that the patents issued were useless without knowledge of certain secret processes which were in possession of the English officials and which had not been transferred to the American manufacturers. After ineffectual attempts to compel a disclosure of the secret processes, the American company, it is claimed, discovered that the English syndicate was endeavoring to transfer the rights to the secret processes to some other persons, leaving the Valveless Inner Tube Co. with the worthless patent rights. As soon as this state of affairs became evident the American company started suit in the Federal court, asking that the English company be enjoined from disposing of the rights to the secret processes to any person or company in the United States, excepting the Valveless Inner Tube Co., which company claims to have bought the secret process along with the patent rights, although the written agreement with Wishart does not specifically mention the so-called secret process in the transfer of United States patent rights. A hearing has been set for the first Monday in March.

Denies All Interest in Lansden Deal.

Although the recent purchase of The Lansden Co., of Newark, N. J., by interests represented by W. L. Case of the Mack Bros. Motor Car Co., generally was accepted as the first definite move of the International Motor Co. to engage in the manufacture of electric vehicles, C. P. Coleman, president of the latter company, not only declares that his organization, which comprises the Mack and Saurer truck interests, has no interest whatever in the Lansden concern but that it has no intention of acquiring any interest in it. At the time the International Motor Co. was organized, and took over control of the Mack and Saurer properties, it was freely stated that the production of electric vehicles was included in the plans and would be taken up in due course, but when asked to deny this report Mr. Coleman preferred not to make answer.

New Men Enter the De Tamble Company.

Following an increase of the capital stock of the De Tamble Motors Co., of Anderson, Ind., to \$200,000, and the acquirement of \$101,000 of it by James W. Sansberry, president of the National Exchange Bank of that city, and certain of his associates, the De Tamble company again has undergone semi-reorganization. Sansberry himself has assumed the general management, replacing Charles H. Walters who has been given the title of general superintendent.

MICHELIN REVISES TIRE PRICES

Substantial Reduction on Both Tires and Tubes—Action of Other Manufacturers Remains Problematical.

Reports which have been circulating for all of four months that reductions in the price of tires were impending, materialized on Monday last, 19th inst., to the extent that on that date the Michelin Tire Co. announced a general downward revision of its price schedule. 34 x 4 casings, for instance, have been reduced from \$39.10 to \$35.75, 36 x 4½ from \$52.90 to \$47.25, and 37 x 5 from \$66.10 to \$58.75, which figures are respectively \$3.35, \$5.65 and \$7.35 less than those prevailing on the products of other big companies. The prices of Michelin inner tubes also were reduced but they still remain slightly higher than those asked for other standard tubes. Michelin tubes 34 x 4, formerly held at \$8.60, are now \$8, and 36 x 4½, which formerly were \$12.20, are now \$11.

Early last month most of the other big tire companies lengthened their discounts to the trade, but the retail prices of their goods were not altered, and inquiry discloses that as yet they have taken no action toward meeting Michelin's new figures.

Valvoline Locks Horns With Havoline.

Closely following the filing of the suit of the Wilburine Oil Works, Ltd., against the Wolverine Lubricants Co., as told exclusively in the Motor World of February 8th, a similar action, prepared by the same law firm, has been instituted in the United States District Court for the Southern District of New York against the Havoline Oil Co., of New York, by the Valvoline Oil Co., of Edgewater, N. J. As in the first case, the defendant is charged with "imitation and unfair competition by fraudulently substituting goods of its own manufacture with the intention of deceiving the public," the alleged imitation and unfair competition consisting substantially of the employment of the name Havoline which is claimed to be an infringement of the Valvoline trade-name, which was registered as a trademark for oils as long ago as 1873. The Valvoline company asks that the Havoline Oil Co. be enjoined and be required to pay damages, as well as to deliver to the complainant all receptacles, labels, etc., bearing the name Havoline.

Knight and Edwards Sail to England.

Charles Y. Knight, inventor of the sleeve valve engine bearing his name, and H. J. Edwards, of the embryo Edwards Motor Car Co., sailed today to England where Edwards will arrange for the supply of Knight engine parts which will be employed in the production of his cars and trucks; for the Edwards company will go

largely into truck production, and incidentally will offer the option of either worm or bevel drive. Meanwhile, pending the formal organization of the Edwards Motor Car Co., Edwards and his chief associate, C. G. Stoddard, have opened a temporary office in the Knabe building, 439 Fifth avenue, New York. Although, as stated in the Motor World, Indianapolis men are endeavoring to raise capital to assure the location of the Edwards factory in that city, Mr. Stoddard states that no location is likely to be selected until Edwards returns from abroad.

Car Makers Sue Their Former Agents.

Reversing the usual order of things, and indicating that manufacturers are not always to blame for non-delivery of cars, the Palmer & Singer Mfg. Co., of New York, has brought suit in the New York Supreme Court against Clinton H. Miller and William S. Miller, who did business as the Palmer & Singer Distributing Co. of Philadelphia, for \$25,000 damages for alleged breach of contract. The contract was entered into on February 24, 1910, and gave the Miller brothers the distributing rights for Philadelphia, and the territory surrounding it, within a radius of 75 miles. They agreed to purchase 40 Palmer-Singer cars and to deposit \$4,000, same to be deducted from the price of the last eight cars at the rate of \$500 per car. The complaint charges, however, that the defendants repudiated the contract and thereby damaged the manufacturing company to the amount sued for.

Bull and Gilson in Body Company.

F. K. Bull, president of the J. I. Case Threshing Machine Co., has been elected president of the Racine Mfg. Co., of Racine, Wis., which claims to have the largest exclusive automobile body plant in the world. J. W. Gilson, former assistant secretary and sales manager of the Mitchell Lewis Motor Co., also has joined the body building company in the capacity of vice president and sales manager. The other officers are G. W. Jagers, treasurer, and Harold Smith, secretary. Coincident with the entry of new men into its affairs, the capital stock of the Racine company has been increased from \$400,000 to \$800,000.

Pelletier Goes to Universal Trucks.

E. LeRoy Pelletier, advertising manager for the Studebaker Corporation and the Flanders Mfg. Co., has taken up similar duties for the Universal Motor Car Co. of Detroit, which may or may not be merged with the Flanders Mfg. Co. The negotiations to that end which developed a hitch being still in progress. Pelletier is Walter E. Flanders's right bower, and recent happenings in the Studebaker Corporation, in which Pelletier has played no small part, make his affiliation with the Universal company less surprising than may appear on the surface.

CHRISTIE AGAIN COMING TO FRONT

Now Turns to Trucks and Fire Apparatus and is Forming New Company—His Perfected Drive.

Walter Christie, of New York, who devoted his fortune and some eight years of his time to the perfection and exploitation of his front wheel drive, has refused to be discouraged and has in process of organization a new company which will be styled the Front Drive Motor Co., for which there already has been secured a factory in Hoboken, N. J., at Sixteenth and Clinton streets. The new company, however, will have nothing to do with pleasure cars, in which Christie once was so greatly interested, but will devote itself wholly to trucks and fire apparatus, the trucks being of three-ton capacity only.

Though adhering to the front drive and steer principle, Christie has greatly changed and simplified the mechanism, as compared with the pleasure cars he built in former years. The motor formerly was placed crosswise, with its crankcase acting as the front axle, and the crankshaft driving the front wheels through a complicated arrangement of gears and universal joints. The new truck motor, however, is placed in the usual fore-and-aft position, but drives first forward through the clutch and gearbox, and then backward, through sprockets and chains to a countershaft which carries spur pinions meshing with internal gears carried by the wheels themselves. The countershaft has universal joints placed in line with the steering pivots, so that steering is permitted and power is transmitted while the wheels are being used for steering. The power-carrying chassis will be on a frame of its own and will constitute practically a two-wheeled tractor, connected to the load-carrying part of the truck by means of a turntable, which can be used in connection with the ordinary steering gear to give greater turning radius. By the use of the turntable it will be possible to turn the front wheels through an angle of 90 degrees, so that the vehicle will turn in its own length.

Drop in Price of Aluminum Leads to Law.

The fall of the market price of aluminum during the past year is the chief cause of a suit which just has been filed in the New York Supreme Court by the British Aluminum Co., Ltd., against the United States McAdamite Metal Co., charging the latter with breach of contract. The complaint sets forth that on December 3, 1910, the two warring parties entered into an agreement, according to which the British company was to supply the American concern with 100 long tons of pure ingot aluminum, at the rate of twenty-one cents per pound. During the year 1911,

there were actually delivered to the McAdamite company 35 long tons, which were paid for at the contract price, or \$16,464. On December 31, 1911, however, the defendant company refused to order any more aluminum at the rate agreed, and, it is charged, is endeavoring to wind up its business in New York. On that date, the market price of aluminum is said to have been about 17½ cents per pound, or \$26,208 for the 65 long tons, contracted for but not taken. As the contract price for these 65 tons was \$30,576 the English company considers itself entitled to the difference between the two sums, and accordingly sues for \$4,368 plus interest and costs.

Stromberg Brings Suit Against Flechter.

Alleging that the so-called "Locomotive type" carburetter, manufactured and marketed by L. V. Flechter, of New York City, is an infringement of claims 3, 4, 5 and 6 of patent No. 928,042, issued on July 13, 1909, to John S. Goldberg, of Chicago, Ill., the Stromberg Motor Devices Co., of Chicago, as assignee of the latter, has filed suit in the United States District Court for the Southern District of New York, against L. V. Flechter. In this it asks for a perpetual injunction, accounting and damages. According to the complaint, John S. Goldberg, on July 13, 1909, obtained the patent in question and assigned it to the Goldberg Motor Car Devices Co., of Chicago. Several months later the name "Goldberg" was changed to "Stromberg," and the word "Car" dropped from the title of the company, the name becoming Stromberg Motor Devices Co., under which title the company and its carburetters have become famous in the automobile trade.

Seeking to Continue "College-Bred" Car.

In the effort to save the remains of the Cater Motor Car Corporation, of Washington, D. C., and to continue the manufacture of the "College-Bred" Washington car, A. Gary Carter and other officers of that embarrassed company are organizing what will be known as the Washington Car Mfg. Co. They claim to have secured sufficient support in Washington and Hyattsville, Md., where the factory is located, which will permit them to continue the business, with or without the free labor contributed by the students of the Washington "automobile college," which was an annex of the Carter Corporation.

Michelin Sues on Consignment Account.

Alleging that he failed to keep his stock intact, and that he failed to remit money for the tires shipped to him on consignment and of which he had disposed, Chas. H. Bellinger, of Newburgh, N. Y., has been made defendant in a suit for \$911.15 brought by the Michelin Tire Co. in the New York Supreme Court. This action is one of a number which the Michelin company has instituted against other dealers on exactly similar grounds.

CASE'S EARNINGS ARE DISCLOSED

Sale of Its New Preferred Stock Makes Figures Public Property—Has Never Had Unprofitable Year.

In offering to the public the \$8,000,000 of J. I. Case Threshing Machine Co.'s 7 per cent. preferred stock, which recently they purchased, J. P. Morgan & Co. have made public some details of the Case organization which give an insight into the extent and earning capacity of the business. They are contained in a communication addressed to Morgan & Co., by Frank K. Bull, president of the J. I. Case Threshing Machine Co. Among other things, and of particular interest to the automobile industry, Mr. Bull states that the Case company is "acting as distributing agent for the Case automobile manufactured by the Pierce Motor Co.," but that "the J. I. Case Threshing Machine Co. has no commitment in the manufacture of automobiles."

The company's chief business, as always, is the manufacture of agricultural implements which, broadly, includes gas engines and road making machines. Mr. Bull states, however, that on a tract of 80 acres near Racine, Wis., it is planned to erect buildings which "will largely increase the output, including gas tractors, etc."

For the eleven years, 1901 to 1911, inclusive, the Case company's gross sales have averaged \$5,480,000 per annum, the figures by years being as follows: 1901, \$3,774,000; 1902, \$4,249,000; 1903, \$5,152,000; 1904, \$4,092,000; 1905, \$5,189,000; 1906, \$6,143,000; 1907, \$4,831,000; 1908, \$4,407,000; 1909, \$5,996,000; 1910, \$6,947,000; 1911, \$9,500,000 (partly estimated.)

The profits for the last six years have averaged \$1,054,177 per annum, as follows: 1906, \$1,080,347.77; 1907, \$674,344.19; 1908, \$586,746.93; 1909, \$1,336,234.49; 1910, \$1,047,396.07; 1911, \$1,600,000.00 (partly estimated.)

The business has never had an unprofitable year and since 1880 has paid dividends amounting to \$9,073,000. Its real estate, plant, buildings, machinery, furniture, etc., are valued at \$4,449,223.42, and its horses, wagons, rolling stock, patterns and patents at \$412,879.70, but since the date of this appraisalment, December 21, 1911, there has been written off for depreciation a total of \$434,000. President Bull places the actual value of the company's assets, over and above all indebtedness and liabilities, except capital stock, at more than \$2,700,000, the quick assets being placed at \$15,800,000. Among other things it is brought out that the Case company owns a manufacturing site, comprising 192 acres, at Fort William, Ont.

The proceeds of the sale of the \$8,000,000 preferred stock sold to J. P. Morgan & Co., who in turn are offering it to the pub-

lic, will be used to redeem and cancel on May 12, 1912, all of the present outstanding bonded debt (\$2,300,000), and to the extent of about \$1,200,000 for increases in plant and manufacturing facilities during the next 15 months. The balance will be used, together with the proceeds from bills receivable (\$9,405,643.70) as realized, for the retirement of present bills payable (\$5,425,000) as they mature. Upon the execution of this program the company will have no bonded debt whatsoever, and it receives sufficient funds to enable it to retire the floating debt.

The stock will remain in the hands of a voting trust for a period of three years, the voting trustees being Frank K. Bull, president of the Case company, Francis L. Hine, president of the First National Bank of New York, and William E. Black, of Cary, Upham & Black, of Milwaukee. As a result of the consummation of the stock transaction, with Morgan & Co., Messrs. Hine and Black were elected directors of the J. I. Case Threshing Machine Co., together with Thomas W. Lament, of J. P. Morgan & Co., Alexander M. White, of White, Weld & Co., New York, and E. J. Low, the New York bankers' counselor-at-law.

Dealer Obtains Order and Disappears.

There's trouble in store for H. B. Doherty, a Binghamton (N. Y.) dealer, when he returns—if ever he does—from his trip into the "unknown" regions of the West. For Doherty before leaving made a contract with the Binghamton Police Department to furnish it a motor patrol for \$2,100, and the question now is as to who is going to make good on the contract, as Doherty took the trip West after the contract was signed, and since has failed to show up, or to write as much as a postal card telling of his whereabouts. The Dayton Motor Car Co., which was to furnish the chassis, is not quite sure whether it has any responsibility for the act of its dealer. In the meantime the salesrooms and garage of the H. B. Doherty Co., at 25-27 Washington street, remain closed and creditors of the company are preparing to bring their demands into court. Mrs. Doherty admitted that her husband had debts and that she had no news from him.

Chase Forms New Mansfield Company.

B. L. Chase, president of the bankrupt Mansfield Rubber Co., of Mansfield, O., which was torn asunder in the recent arrest of Charles H. Walters, one-time vice-president and general manager of the company, has organized and incorporated the Mansfield Tire and Rubber Co., for the purpose of continuing the business on a more wholesome scale and with dissension and dissenters omitted. The new company is capitalized at \$300,000, and in addition to Chase, Walter F. Heene, George W. Heene, C. R. Grant and F. M. Bushnell figure as incorporators.

SUES FOR COMMISSION ON STOCK

Its One-Time "Security Department" Makes Things Unpleasant for Newark Truck Company—Wants \$5,900.

When the Newark truck was exhibited at the show in Grand Central Palace last month by its maker, the Newark Automobile Mfg. Co., there was nothing to suggest that it had been attached by the sheriff. That this has been the case, however, came out last week when the suit of Michael P. Caffé vs. the Newark Automobile Mfg. Co. was called in the New York City Court, at which time Justice Donnelly granted an order vacating the attachment, two surety companies having given bond for the defendant company against any judgment which might be rendered against them—not exceeding \$2,750.

According to the papers on file the Newark Automobile Mfg. Co., on July 25, 1911, entered into an agreement with Charles Hallock and L. R. Bonta, under which the latter were to endeavor to sell \$160,000 worth of the \$500,000 stock of the Newark company on a commission basis of 15 per cent. The men furthermore were required to establish an office and clerical force, and, doing business under the style The Securities Department, to advertise and push the sale of the stock in such a manner as to sell not less than \$20,000 worth the first three months, \$5,000 worth every month thereafter or not less than \$30,000 worth during any three successive months. For the purpose of assisting the sale one of the trucks of the Newark company was to be at the disposal of the Securities Department during the time of the stock-selling campaign.

Whether the stock of the company was difficult to sell, or the brokers' methods were ineffective in selling it, does not appear from the records; but it is claimed that not a single share of the stock was actually sold by them, and that the only stock disposed of was sold by the Newark Automobile Mfg. Co. itself, to the amount of \$39,500. Despite the fact that this stock was sold direct, and without the assistance of the two brokers, the latter considered themselves entitled to the commission on these sales, amounting to \$5,925, and promptly assigned their claim—less \$150 due on a promissory note given by Hallock to the company—to one Michael P. Caffé, who, as promptly, began suit for the \$5,775. Affidavits made by Hallock, Bonta and Caffé procured an attachment on the truck exhibited at the Palace show, until the surety companies came to the assistance of the defendant with their bonds.

The agreement with Hallock and Bonta is signed by Joseph J. Rafter, who resigned the presidency of the Newark company last month, and John T. Walsh, formerly sec-

retary, who succeeded to the vacancy created by Rafter's retirement.

Note Transaction Involves Bridgeporters.

Growing out of a dispute involving a note for \$20,000, an attachment has been filed by Samuel H. Wheeler against the Macfarlane Bros. Mfg. Co., Park City Motor Car Co., Miller Motor Car Co., and Francis H. and Thomas E. Macfarlane, all of Bridgeport, Conn. The complainant also asks for an injunction to restrain negotiations for \$50,000 and for an order requiring a disclosure of the assets of the Macfarlane Bros. Mfg. Co., likewise to seek \$25,000 damages. According to the complaint in the case, on June 28, 1910, the defendants, excepting Thomas E. Macfarlane, gave a note for \$20,000 to Wheeler, who charges that in September of the same year, the Macfarlane brothers transferred, for the purpose of escaping liability on the note, two pieces of property, giving their note to the Macfarlane Bros Mfg. Co.

H. M. Swetland With Commer Trucks.

H. M. Swetland, formerly president of the Class Journal Co., has been elected chairman of the board of directors of Wyckoff, Church & Partridge, Inc., of New York City, in which he has acquired an interest. Mr. Swetland will not be in strange company as E. S. Partridge, of Wyckoff, Church & Partridge, once was associated with him in the publishing business, while Thomas J. Fay, the corporation's chief engineer, until recently was the editor of one of Mr. Swetland's publications.

Forgings Company Formed in Detroit.

The Automobile Forgings Co., which has been organized in Detroit under Michigan laws, with \$100,000 capital, has taken possession of its plant, 33 Richmond street, Detroit, and will be ready for business within a week. George W. Strelinger is president of the new company and G. W. Vandever is vice-president, both of whom were connected with the Rands Mfg. Co., of Detroit, for the past seven years.

Studebaker Note Issue Is Snapped Up.

The Studebaker Corporation has sold \$8,000,000 serial 5 per cent. gold notes, maturing \$400,000 semi-annually for ten years, all of the issue having been taken by banks and, accordingly, none will be offered to the public. The proceeds of the notes will be used for refunding purposes and the issue therefore will not increase the debt of the company.

Post & Lester Secure Broader Charter.

The Post & Lester Co., of Hartford, Conn., has filed an amendment to its Connecticut charter whereby the company is authorized to manufacture and deal in goods of every description. In exactly just what direction the company proposes enlarging its scope has not yet been made plain.

BELLAMORE BOTHERED BY SUITS

Builders of Armored Car Find Little Peace in Bridgeport—Miller Wants Its Factory Deeded Back.

One more of a series of actions which have been brought against the Bellamore Armoured & Equipment Car Co., has been filed by George C. Miller, one of the stockholders of the Bridgeport Vehicle Co., whose plant was taken over by the Bellamore concern, which set out to make an armoured or burglar-proof car for use by banks and similar institutions. Miller asks the court to require the Bellamore company to deed back the property to the Bridgeport Vehicle Co., and to cancel the deeds which the company now holds. He also asks damages to the amount of \$7,500. He charges that the Bellamore concern acquired the property through the illegal action of two stockholders, Allan W. Terry and James W. Horton, and that the Bridgeport Vehicle Co.'s property is valued at \$130,000, while the Bellamore company is "without financial responsibility," and was organized solely to exploit certain patent rights held by David H. Bellamore.

Henry D. Miller also has brought action against the company, seeking to reopen the judgment discharging the receiver. Miller claims that he was promised 10 per cent. commission on all orders he secured and that there is a balance due him of \$750. The former receiver, John T. King, claims that he settled in full with Miller when he was discharged and that if anything is due Miller must look to the Bellamore company for relief.

Litigation Follows Tire Gauge Contract.

After hearing argument, Judge Davis, in the New York Supreme Court, Special Term, on Monday last, 19th inst., denied a motion made by the Hartford Machine Screw Co., of Hartford, Conn., asking that the Allen Auto Specialty Co., of New York, be required to furnish a bill of particulars in the suit in which the New York company is the defendant. The Hartford company's motion was born of the tart answer to its complaint made by the Allen company.

The litigation grew out of a contract entered into between the two companies whereby the Hartford concern agreed to supply the Allen Auto Specialty Co. with 25,000 sets of parts for tire pressure gauges, which the complainant alleges were duly delivered, but for which \$1,150.11 of the contract price remains unpaid, and it was for this sum that the Hartford Machine Screw Co. entered suit. In its reply the Allen company not only asserted that the Hartford concern, as a foreign corporation, had no legal standing in New York courts, but also alleged that deliveries

of the parts in question were tardy and that the workmanship required that they be returned to the manufacturers, which procedure the Allen company claimer had caused trouble for them with jobbers and dealers, and had involved them in large expenses and caused them to suffer damage, because of which they asked that the suit of the Hartford Company be dismissed and that it be ordered to pay \$10,000 damages. It was then that the Hartford Machine Screw Co. asked the court to require the Allen Specialty company to file a bill of particulars, setting forth the specific return of defective parts, the expenses incurred, the damages sustained, etc., which application, as stated, was denied by Judge Davis.

Indianapolis Keeps Prest-O-Lite Plant.

It now is wholly unlikely that the plant of the Prest-O-Lite Co. will be removed from Indianapolis, as was threatened only a few weeks since, the city council having enacted the desired ordinance, which will permit the company to locate a charging plant within the city limits and thereby avoid the great expense which is at present entailed in maintaining two widely separated establishments, a tank factory and a charging plant, the latter of which is located some five miles south of Indianapolis proper. The ordinance provides that no such plant shall be located closer than one mile to the monument which marks the heart of the city, or closer than 100 feet to any other building or public highway; it also requires that the work be carried on in fireproof buildings surrounded by a wall or other enclosure on which warning signs must be posted. The ordinance further specifies how the manufacture and storage of the gas shall be conducted, one provision requiring that where 20 to 25 tanks are to be stored they must be placed in a self-enclosing firebox; where there are more than 25 such tanks they must be placed in a fireproof vault. This latter provision applies also to all garages.

McAdamite Metal Factory for Detroit.

The United States McAdamite Metal Co., of Brooklyn, N. Y., which manufactures aluminum products for the automobile trade, among others, is about to establish a factory in Detroit. For the purpose a site with a frontage of 150 feet has been purchased at Isabella avenue and E street, on which a steel and concrete building, 90 x 150 feet, will be immediately erected. It is expected to be ready for occupancy on or about April 1st.

Physician at Head of Truck Project.

Dr. John G. Barnsdale, of Superior, Wis., is at the head of a project which has for its purpose the establishment of a truck factory in that city. Dr. Barnsdale recently was in the East and contracted for parts necessary for the construction of the first ten trucks.

OLD TRADESMEN IN NEW PLACES

Promotions, Transfers, Resignations and Appointments That Have Occurred During the Past Several Days.

Edward Wells, of Boston, who previously was connected with the E. R. Thomas Motor Car Co., of Buffalo, has returned to that company in the capacity of assistant sales manager.

S. N. Bourne, formerly Western sales manager of the E. R. Thomas Motor Car Co., has joined the staff of F. B. Stearns Co. He will cover Western territory for the Stearns people.

Charles E. Bailey has been appointed sales and advertising manager for the Republic Motor Car Co., of Hamilton, O. Previously he was connected with a New York automobile trade publication.

Lucius S. French, assistant secretary of the Henderson Motor Sales Co., of Indianapolis, has resigned that office to engage in the piano trade. His resignation will take effect March 1st.

Edgar E. Muller has been promoted to the management of the recently established service department of the Ohio Motor Car Co., of Cincinnati. He has been connected with the company since its inception.

Walter T. Carlson has been appointed manager of the Stromberg Motor Devices Company's Northwestern branch in Minneapolis. He succeeds Harvey Goodwin, who resigned to join S. G. Chapman, the San Francisco agent for Hudson and Hupmobile cars.

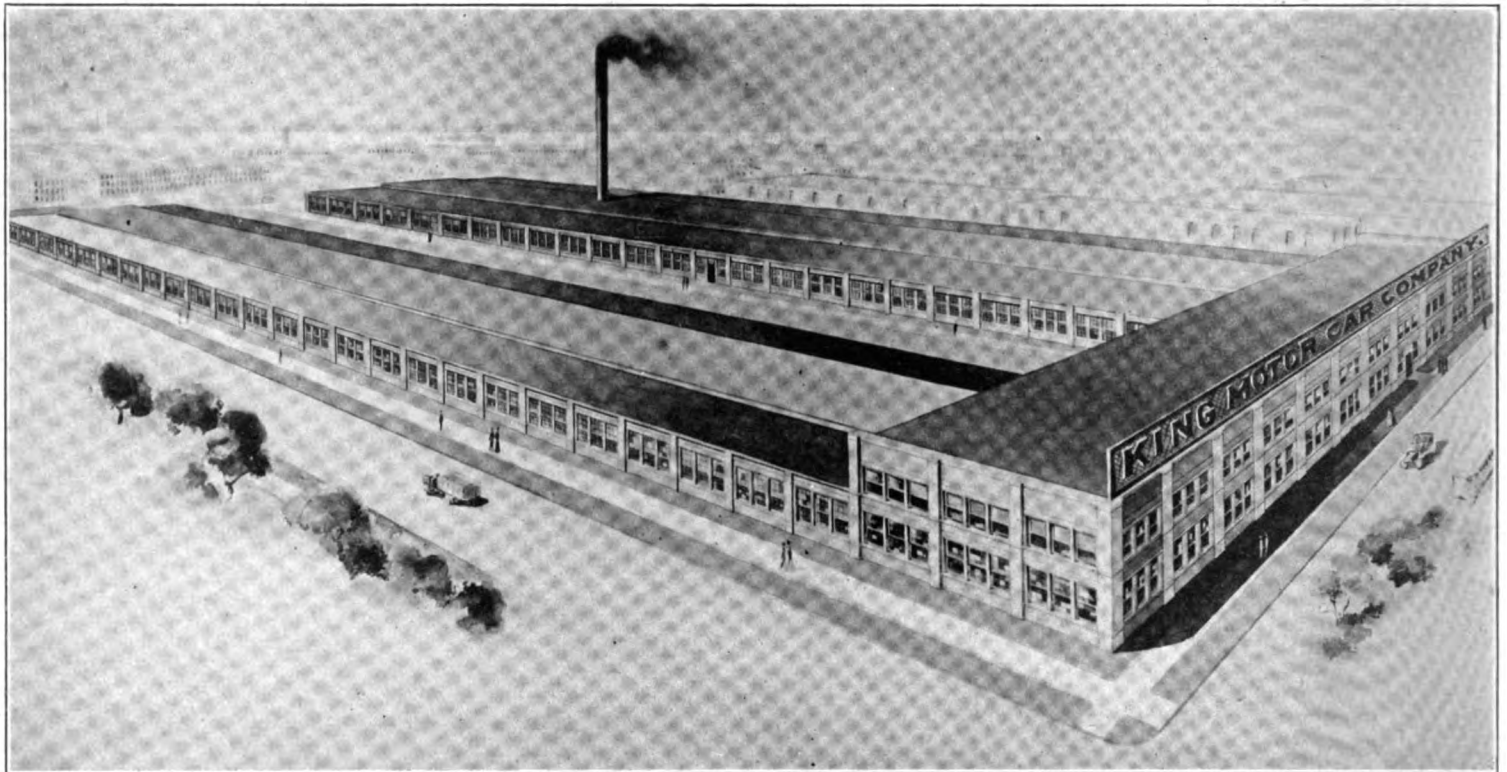
Robert T. Walsh, formerly advertising manager for the Art Stove Co., has been appointed advertising manager for the Metzger Motor Car Co., of Detroit. Walsh served his apprenticeship in automobile advertising with the Ford Motor Co. several years ago.

E. F. White, who has been identified with the industry for the past nine years, latterly as Pullman agent in Reading, Pa., has joined the headquarters' staff of the Pullman Motor Car Co. itself. He will represent the company in the middle western and southern territory.

* F. W. Stewart, formerly with the Badger Motor Car Co., of Columbus, Wis., has been appointed sales manager for the Monitor Automobile Works, of Janesville in the same state. He will, however, make his headquarters at the recently established general sales office in Chicago.

H. S. Stebbins, of the General Motors Truck Co., has been promoted to the management of the Eastern District with headquarters in New York. Previously and for several years he was traffic manager of the General Motors Co., which position he still retains in connection with his other duties.

FACTORY ACQUIRED BY THE KING MOTOR CAR CO., IN DETROIT, MICH.



Because of the undoubted "hit" made by the King car, the King Motor Car Co., has so far outgrown its present plant at 1559 Jefferson Avenue West, Detroit, that it has decided not to erect a factory, as was the original intention, but instead has acquired one already built, of which it

will take possession March 1st. It is the factory now occupied by the Hupp Motor Car Co. at Concord avenue and Jefferson avenue East, which the Hupp company will vacate now that its new plant is practically completed. This move on the part of the King people will give them a fac-

tory comprising, approximately, 70,000 square feet and having a capacity for 5,000 cars per year. The plant is a comparatively new structure, having been erected only in 1909. It comprises a group of four buildings, all connected, with a frontage of 130 feet on Jefferson avenue.

Carlson-Maxwell Argument Concluded.

Argument in the long pending suit of the Carlson Motor & Truck Co. against the Maxwell-Briscoe Motor Co. was concluded last Friday in the United States Circuit Court of Appeals in New York, but the decision of the judges, Messrs. Lacombe, Noyes, Coxe and Ward, probably will not be rendered within three weeks.

As will be recalled the suit hinges upon patent No. 797,555, which Charles A. Carlson obtained on a removable cover plate used on double-opposed two-cylinder gasoline motors, which patent is alleged to have been infringed by Maxwell-Briscoe several years ago, when the Maxwell-Briscoe company brought out a few vehicles of this kind. It long since discontinued their manufacture and the total royalties that will be awarded in case the Court of Appeals finds in favor of Carlson, can amount to only a small sum.

In its defense to the original suit, the Maxwell-Briscoe company denied the validity of the patent and its alleged infringement, but the court found in favor of the Carlson company. Thereupon the Maxwell company filed the appeal, which the Court of Appeals now has under consideration.

Regardless of its outcome, the case is of little importance to the trade as the patent is very narrow in scope and covers only a "removable cover plate and cam followers mounted in said cover plate and removable therewith" — a construction which at present is practically obsolete in automobile manufacture. There are only a few makers of cars utilizing double-opposed cylinders in their power plants, and none of them is said to infringe this particular provision of the Carlson patent.

Tire-Dating Bill in New York Legislature.

One of those "funny" bills which originated in the West and which seeks to require that all tires be branded with the date of their manufacture, has been introduced in the New York Legislature. Assemblyman Lewis S. Chanler is the sponsor of the bill, which would impose a fine of \$50 for each undated tire.

Goodrich to Open Depot in Spokane.

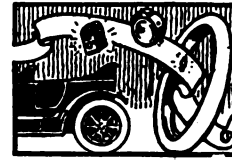
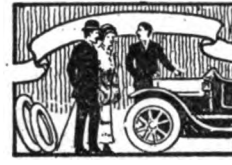
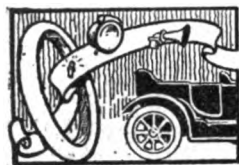
The B. F. Goodrich Co., of Akron, O., has leased quarters at S110 Cedar street, Spokane, Wash., which will be opened for business about March 15th. It will be in charge of R. H. Rowe, who has had long experience in the tire business.

New Officers for Newark's Truck Company.

At the annual meeting of the Newark Automobile Manufacturing Co., of Newark, N. J., maker of the Newark truck, which was held last week, John T. Walsh was elected president to fill the vacancy which has remained since J. J. Rafter resigned the office. The other officials chosen are as follows: Vice-president, John W. Phillips; secretary and treasurer, H. V. Radonitz; counsel, Roland D. Crocker; directors: John T. Walsh, John W. Phillips, H. V. Radonitz, David King, Carl W. Johnson, W. B. Abbey, Roland C. Crocker, Chester A. Jones and Bela Cukor, LL.D. Walsh formerly was secretary of the company.

Iron Works' Automobile Venture Fails.

The Richmond Iron Works Corporation, of Richmond, Va., which about a year since took up the manufacture of the Virginian automobile, has filed a petition in bankruptcy, following which H. D. Eichelberger was appointed receiver. The liabilities of the company are \$67,577.96, and its assets \$111,351.90. Most of the creditors, it is stated, are Richmond firms and individuals, all of whom are secured. Among its assets the company numbers real estate valued at approximately \$75,000.



Eugene Lowery has opened a garage in Puente, Cal.

Harry Olewine has opened a garage in Hazelton, Pa.

Ed Richter has opened a repair and paint shop in Waverly, Ia.

David Jones and C. W. Sells are building a garage in Columbus, O.

Henry Kuschel is building a two-story brick garage in Pittstown, Pa.

Joseph Severa & Co. have opened a salesroom and garage at Battle Creek, Neb.

Charles and Louis Stroh are building a garage on Main street, Bayport, N. Y.

Edward Prouty has purchased the William Miller Garage in Richland Center, Wis.

A new garage is being built in Oakland City, Ind., by Mont. Campbell and U. G. Butcher.

The Smith Garage Co. has "opened up" in Baltimore, Md. It is located at 1523 Retreat street.

John Cook, who operated a garage in New London, Ia., has sold it to George Van Hying.

The John & Philip Berst Garage, of Bloomer, Wis., will be moved to Chetek in the same State.

The Palace Garage has been opened on South Davie street, Greensboro, N. C., by Garland A. Ricks.

C. A. Curl has bought the F. H. Maynard Garage in Scotland, S. D. He has the agency for Reo cars.

Dr. C. E. Whorter has entered the automobile business and opened a garage on Main street, Sinton, Tex.

The Wilmot-Dwyer-Helmer Co. is the style of a new garage which is being erected in Rosalia, Wash.

A new garage has been opened at the corner of Mill and Main streets, Springfield, Ore., by Elmer Cox.

George Bessinger and Harry B. Moore have formed a partnership and will open a garage in Sheboygan, Wis.

Sam Holden and H. O. Guernsey soon will open a garage in Velva, N. D., under the style the Star City Garage.

The H. & S. Auto Co. has opened a salesroom and garage at 28 North Fountain avenue, Springfield, Ohio.

C. W. Miller and Dr. H. C. Newman are building a garage and salesroom in Wadena, Minn. They handle Ford cars.

Higgins, Texas, has become possessed of a garage. C. D. Bellah, H. L. Zollars and Martin Madson are the men who own it.

E. N. Cossette has re-opened the garage and salesrooms in Howard street, Lowell, Mass., where he handles E-M-F and Flanders cars.

Harold Handy and Maxfield Lewis have formed the Handy-Lewis Motor Co., and opened a garage on Litchfield avenue, Willmer, Minn.

At a cost of \$7,000 a one-story, fireproof garage is being erected on Rock Island street, Davenport, Ia., for the Davenport Auto Truck Co.

William E. Bourne has purchased property on Geneva street, Lyons, N. Y., on which to erect a garage. Burton Fisher will be his partner.

C. A. Lamus has purchased the interest of H. B. Murdoch in the firm of Graham & Murdoch, who operate an electric garage in Sacramento, Cal.

A new garage has been opened in Colfax, Wash., of which David White and Robert Morrell are the owners. Everitt cars will be handled.

Jack Beehan, partner in the Webb City Carriage & Auto Co., Webb City, Mo., has purchased the interests of his associates and become sole owner.

Jack Dunfield and Le Roy Welch have purchased the M. C. Dillman Garage in Colusa, Cal. Welch also is proprietor of the Pioneers Auto Stage Co.

E. E. Gargett has opened an accessory salesroom at 1849 Euclid avenue, Cleveland, O. He will do business under the style Motor Supply & Tire Co.

O. J. Edinger has begun business in South Edmonton, Alta, Canada, trading under the style S'Cona Garage. He has the agency for Abott-Detroit cars.

R. J. Read and J. E. Beatty have formed the Read Auto Co. and opened salesrooms at 541 Woodward avenue, Detroit, Mich. They will handle the Metz car.

Baumgardner & Kibby, who handle the Marathon line of cars in Toledo, O., have added commercial vehicles to their offerings. They will feature the Cass truck.

The United Delivery Co., which operates a delivery business in Paynesville, Ohio, has added a garage; it will be located on the site of the Gallett stable property.

Robert Menzil has purchased the automobile repair business of the Lake Mills Implement Co., the Iowa town of that name, and will conduct it in his own name.

H. J. Christenson has sold a half interest in his garage at Wilmot, S. D., to Oscar B. Richert. The business hereafter will be conducted as the Christenson & Richert Co.

The Perry Motor Supply Co. is the style of a new company which on March 15 will open a supply house at 102 Allyn street, Hartford, Conn. O. A. Perry is the president.

H. L. Converse, who formerly was with the Boston Electric Garage Co., has taken the agency for Ohio electrics in Boston, Mass. He will open salesrooms within the next few days.

The Syracuse Auto Supply Co., which was incorporated last week with \$25,000 capital, has opened salesrooms in the Guernsey building, Syracuse, N. Y. B. R. Newhall is the manager.

D. Harvey Elder and U. R. Jensen have formed a partnership and opened a garage at 401 East Bailey street, Whittier, Cal. They will do business under the style of Bailey Street Garage.

The poolroom at the corner of Third and Warren streets, Hudson, N. Y., is being converted into a garage, which when completed will be conducted by Edward Malley and John Hester.

With the object of distributing Detroit cars in Philadelphia, Pa., E. M. and A. W. LaRoche have opened salesrooms at 2033 Market street. They will do business as the Detroit-Philadelphia Co.

Frank G. Fickling, formerly of the Frank G. Fickling Co., and W. W. Fickling, of Philadelphia, have formed a partnership and opened salesrooms at 1401 I street N. W., Washington, D. C., where they will deal in accessories.

Allison G. Ames, for several years owner of the Stuyvesant Garage at 41-43 Marion street, Brooklyn, N. Y., has sold his business to G. F. Morrison, who has engaged G. B. Rockwell as manager. Cutting cars are handled.

Recent Losses By Fire.

Traverse City, Mich.—Hines Motor Co.'s plant damaged. Loss, \$25,000.

Columbus, O.—Columbus Auto Brass Co.'s plant damaged. Loss, \$25,000 in stock and machinery.

Detroit, Mich.—Detroit Seamless Steel Tubes Co.'s plant, 841 Jefferson avenue, damaged. Loss, about \$10,000.

New York City, N. Y.—St. Nicholas Auto Depot, 54 West 67th street, building and 50 cars destroyed. Loss, heavy.

Point Breeze, Pa.—Atlantic Refining Co.'s works destroyed; 500,000 gallons lubricating oil burned. Damage, \$80,000.

Alliance, O.—Tramsue-Williams Co.'s plant gutted by fire. Loss, \$50,000. The company makes forgings for automobiles and bicycles.



Ottawa, Ont.—Victoria Garage Co., under Ontario laws, with \$100,000 capital; to do a general garage business.

New York, N. Y.—Hastings Spring Co., under New York laws, with \$10,000 capital; to manufacture automobile springs.

Chattanooga, Tenn.—Chattanooga Truck Co., under Tennessee laws, with \$4,000 capital. Corporators—C. M. Willingham, A. C. Willingham, Z. H. Taylor, R. L. Ely.

Rock Island, Ill.—Tri-City Auto Supply Co., under Illinois laws, with \$2,500 capital; to manufacture automobile supplies. Corporators—O. P. Sala, Jr., E. M. Sala, Frank Sala.

Forest City, Me.—Forest City Automobile Co., under Maine laws, with \$25,000 capital; to manufacture automobiles. Corporators—J. A. York, W. B. Clarke, and others.

Paterson, N. J.—Auto Shop Co., under New Jersey laws, with \$50,000 capital; to do a general automobile business. Corporators—W. McKee, F. Beggs, G. F. Wright.

Newark, N. J.—Kaplan Auto Supply Co., under New Jersey laws, with \$25,000 capital; to do a general automobile business. Corporators—A. Kaplan, T. A. Kaplan, L. Umstaeter.

Portland, Me.—Motor Truck and Auto Co., under Maine laws, with \$10,000 capital; to deal in automobiles. Corporators—Lewis A. Goudy, Edward S. Anthoine, and others.

Chicago, Ill.—Available Truck Co., under Illinois laws, with \$25,000 capital; to deal in commercial vehicles. Corporators—Edward F. King, Alfred H. Widhafft, Robert C. Blume.

Indianapolis, Ind.—Oakes Manufacturing Co., under Indiana laws, with \$10,000 capital; to manufacture automobile parts. Corporators—W. D. Oakes, W. H. Oakes, Cora P. Oakes.

Eastport, Me.—Eastport Garage Co., under Maine laws, with \$10,000 capital; to do a general automobile business. Corporators—Fred P. Gilsch, Charles E. Martin, and others.

Wilmington, Del.—Self-spreading Cotter Pin Co., under Delaware laws, with \$250,000 capital; to manufacture cotter pins, etc. Corporators—M. L. Rogers, S. E. Roberson, H. W. Davis.

Bloomington, Ill.—C. U. Williams and Sons Co., under Illinois laws, with \$100,000 capital; to deal in automobiles. Corporators—C. U. Williams, Walter W. Williams, Susie R. Williams.

Chicago, Ill.—Eyles Auto Wheel Co., under Illinois laws, with \$2,000 capital; to manufacture automobile wheels. Corporators—George A. Chritton, John H. Lee, R. A. Raymond.

San Diego, Cal.—Automobile Supply Co., under California laws, with \$10,000 capital; to deal in automobile supplies. Corporators—R. L. Bagly, Robert M. Granger, Nellie V. Bagby.

Sparta, Ill.—Sparta Garage & Supply Co., under Illinois laws, with \$4,000 capital; to do a general garage business. Corporators—Richard J. Jacker, Julius M. Kahn, Samuel A. Landes.

Pittsburgh, Pa.—American Tractor Co., Pennsylvania laws, with \$5,000 capital; to manufacture traction engines, motor cars, etc. Corporators—Joseph A. Becker, Albert H. McNamee, and others.

St. Louis, Mo.—Victor Buggy and Auto Top Co., under Missouri laws, with \$2,000 capital; to deal in buggy and automobile tops. Corporators—Oliver E. Carter, Roscoe F. Perdue, Frank Roband.

Dover, Del.—Dart Manufacturing Co., under Delaware laws, with \$600,000 capital; to manufacture motor vehicles. Corporators—C. W. Hellen, William Galloway, M. L. Bowman, all of Waterloo, Ia.

Mansfield, O.—Mansfield Tire and Rubber Co., under Ohio laws, with \$300,000 capital; to manufacture automobile tires, etc. Corporators—Walter F. Heene, C. R. Grant, F. M. Bushnell, B. L. Chase.

Chicago, Ill.—Englewood Motor Car Co., under Illinois laws, with \$1,000 capital; to do a general automobile repair business. Corporators—Christian Londelius, Jr., A. Eugene Jackson, John F. Wagner.

Los Angeles, Cal.—Los Angeles Auto and Taxi-Cab Co., under California laws, with \$75,000 capital; to operate taxicabs. Corporators—Delle F. Lewis, Harry E. Jones, Evelyn H. Jones and others.

Saco, Me.—Decker Bros. Lock Nut and Bolt Co., under Maine laws, with \$150,000 capital; to manufacture lock nuts and bolts. Corporators—M. L. Decker, Maxwell, Neb.; E. E. Bean, Saco; and others.

Jersey City, N. J.—Whitmore Auto-Gear Composition Co., under New Jersey laws, with \$100,000 capital; to do a general automobile business. Corporators—B. S. Mantz, J. R. Turner, L. H. Gunther.

St. Louis, Mo.—St. Louis Motor Truck Co., under Missouri laws, with \$7,500 capital; to deal in automobiles. Corporators—Charles H. Joerding, Emily L. Haydock, Herman J. Boedeker, John P. Camp.

Plainfield, N. J.—Standard Automobile and Tire Co., under New Jersey laws, with \$25,000 capital; to deal in automobiles. Corporators—H. P. Vosseller, J. J. Slevin, F. Ivamyl.

Detroit, Mich.—Automobile Forgings Co., under Michigan laws, with \$100,000 capital; to manufacture automobile parts. Corporators—George W. Strelenger, David E. Van Derver and others.

Wilmington, Del.—National Auto Spring Tire Co., under Delaware laws, with \$200,000 capital; to manufacture automobile tires. Corporators—R. J. Lackner, A. H. Karr, F. A. McCloskey, all of New York City.

Wilmington, Del.—Taxi Service & Baggage Corporation, under Delaware laws, with \$150,000 capital. Corporators—W. J. C. Dulany, Baltimore, Md.; W. L. Lamberdin and A. P. Thom, Jr., Norfolk, Va.

Cleveland, Ohio—Judd Automobile Co., under Ohio laws, with \$20,000 capital; to deal in automobiles. Corporators—J. F. Judd, Jr., Charles A. Lewis, Harry E. Davis, Raymond F. Blakeslee, Ivan T. Quick.

Elmira, N. Y.—Hatfield Auto Truck Co., under New York laws, with \$1,500,000 capital; to manufacture motor trucks. Corporators—David H. McConnell, A. D. Henderson, A. S. Hoyt of New York City, and others.

Chicago, Ill.—Phillips Gasolene and Kerosene Engine Co., under Illinois laws, with \$6,500 capital; to manufacture and deal in gasolene and kerosene motors. Corporators—Louis C. Kuhnert, Jr., Sidney Adler, Hyman L. Weiss.

Dover, Del.—American Spring Tire Co., under Delaware laws, with \$500,000 capital; to manufacture and deal in tires for automobiles. Corporators—Eugene Mogue, F. Herman, of Graupy, Del.; Charles H. De Vail, of Chicago, Ill.

Changes of Corporate Names.

Chicago, Ill.—Phillips Gasolene Engine and Motor Co., to W. L. P. Co.

Charlotte, N. C.—Abbott Motor Charlotte Co., to American Motor Car Co.

Valdosta, Ga.—Southern Motor Supply Co., to Smith Hardware and Motor Co.

Oak Park, Ill.—United States Ball Bearing Manufacturing Co., to U. S. Ball Bearing Manufacturing Co.

Increases of Capital.

Chattanooga, Tenn.—Chattanooga Rubber Tire Co., to \$15,000.

Stafford, Conn.—Hudson Motor Car and Garage Co., from \$3,200 to \$4,500.



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BRAKES ON FOUR WHEELS AND ON TWO.

"What has become of the brakes-on-all-four-wheels movement?" queries a British engineer. Aye, what has become of it, indeed? Two years ago, or even one year ago, a great hullabaloo was raised over it abroad but it seems to have died a natural, or an unnatural, death. At least, it is significant that at the last Olympia show in London but a single brand of car with brakes on all four wheels was exhibited.

Apparently the greatest difficulty is in perfecting some method of effectually equalizing the front wheel brakes. But until they are completely enclosed in tight housings that will exclude dust, which is largely grit and as such is likely to cause uneven wear and consequently uneven braking strains, it is doubtful if any great degree of success can be attained. In the mean time, it is a question whether the game is worth the candle. Rear wheel brakes have sufficed in the past and they suffice in the present. Are the advantages to be gained by placing brakes on all four wheels sufficient to outweigh the disadvantage of the added complication which they entail?

It is claimed that brakes on all wheels materially reduce tire wear by distributing the braking strain, but there are no data to prove that the aggregate wear on all four tires is not as great as the increased wear on the rear wheels alone when only rear wheel brakes are used. Similarly, it is claimed that brakes on all four wheels appreciably reduce the tendency to skid on slippery roads and pavements, but experience has taught that it is not sufficient to reduce the tendency; the possibility of skidding must be removed if immunity from danger is to be expected, and it has been

demonstrated that the cheapest and most effective way of removing it is to equip one front wheel and one rear wheel, diagonally opposite to each other, either with anti-skid tires or tire chains.

For heavy commercial vehicles, brakes on all four wheels may be looked upon in the light of a necessity, or at least in the light of a very desirable adjunct, for undoubtedly they increase the effective braking area without raising excessively the peripheral speed of the brake drums and therefore reduce the possibility of fires resulting from overheated mechanism. But for comparatively light pleasure cars, the desirability of four brakes is doubtful.

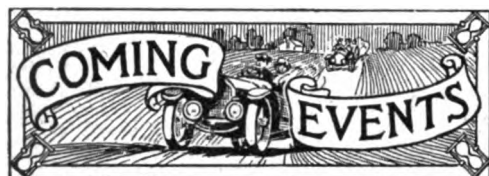
POSSIBILITIES OF THE ROTARY MOTOR.

While the rotary motor, especially of the gas type, for years has been looked upon as something akin to a mechanical impracticability, much as were the aeroplane and wireless telegraph a few years ago, the fact that two of these "dreams" have materialized has had the effect of reviving interest in the rotary motor, and no little work of a really productive character is being done in this field.

It is not unlikely that considerable improvement will be made in the reciprocating type of internal combustion engine, but no matter how far the perfection of details may be carried, there always will remain the fact that the motor is dependent for its operation upon reciprocating motion. It is true that the movement of piston and connecting rod is arrested gradually, comparatively speaking, and that the results obtained are little short of wonderful; but the fact remains that there is a great deal of stress and strain, and wear and tear, that serve no useful purpose, and that the motor must be made sufficiently heavy and strong to withstand such usage, in addition to the legitimate work of withstanding the thrust due to the propulsive force.

In the true rotary motor the stresses due to reciprocation and to the intermittent application of force, which are looked upon as necessary evils, will be absent; the possibilities of a motor having rotary motion only are so obvious and have been dwelt upon so much that in the future—and possibly in the not far distant future—the limits of the reciprocating motor will be approached so nearly that human ingenuity will turn toward the problem of the rotary motor as the logical successor of the now prevalent reciprocating engine. Already there is discernible a tendency in this direction, and though practically all present effort toward the development of the rotary motor is made with steam in view as the propelling agent, there can be no question but that the means for supplying a constant flow of gas at pressure will be forthcoming when the motor proper has been brought to a point where it can produce better results than the reciprocating type.

Despite the fact that most of the essential elements of the modern car have become fairly well standardized, there are several features which have been more or less overlooked in the process, and prominent among them is that part of the control mechanism which is embraced in the gear shifting and emergency brake levers. The method of constructing quadrants, in particular, is susceptible of standardization, and it scarcely is necessary to point out that for safety and convenience it is most desirable. The efforts of the Society of Automobile Engineers in this respect are laudable, and it is to be hoped that manufacturers will heed the advice which has been given them and insofar as possible regulate their designs to accord with those which have been suggested as preferred practice.



February 17-24, Cleveland, Ohio.—Cleveland Automobile Show Company's annual show in Central Armory.

February 17-24, Newark, N. J.—New Jersey Automobile Exhibition Co.'s annual show in First Regiment Armory.

February 17-24, Pittsburgh, Pa.—Pittsburgh Automobile Show Association's annual show in the Exposition Building.

February 17-24, Minneapolis, Minn.—Minneapolis Automobile Show Association's annual display at National Guard Armory and Coliseum.

February 19-24, Hartford, Conn.—Hartford Automobile Dealers' Association's show in the State Armory.

February 19-24, Omaha, Neb.—Omaha Automobile Association's annual show in the Auditorium.

February 19-24, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show of pleasure cars in Music Hall.

February, 20-24, Pinghamton, N. Y.—Annual show in the State Armory.

February 20-28, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in Fifth Regiment Armory.

February 21-24, Louisville, Ky.—Louisville Automobile Association's fifth annual show.

February 21-25, New Orleans, La.—New Orleans Automobile Dealers' Association's first annual show in Washington Artillery Hall.

February 21-28, Toronto, Can.—Toronto Automobile Trade Association's annual annual show in the Armory.

February 22-27, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's annual show.

February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.

February 26-28, Charlotte, N. C.—Charlotte Automobile Dealers' Association's first annual show in the Auditorium.

February 26-28, Cincinnati, Ohio.—Cincinnati Automobile Dealers' Association's commercial vehicle show in Music Hall.

February 26-March 2, Paterson, N. J.—Paterson Automobile Trade Association's annual show in Fifth Regiment Armory.

February 26-March 2, Elmira, N. Y.—Elmira Automobile Club's annual show.

February 26-March 3, Cleveland, Ohio.—Cleveland Motor Club's annual show.

February 28-March 2, Davenport, Ia.—Annual automobile show in the Commercial Club building.

March 2-9, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure vehicles only.

March 4-9, Des Moines, Iowa.—Des Moines Automobile Club's annual show.

March 4-9, Denver, Colo.—Annual show in Auditorium.

March 12-16, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fourth annual show in the State Armory.

March 13-20, Boston, Mass.—Boston Commercial Vehicle Association's show in Mechanics' Hall.

April 29-May 4, Burlington, Vt.—Burlington Merchants' Protective Association annual show in State Armory.

Would Make Racing a Misdemeanor.

Quite unexpectedly, Senator McManus, who is one of New York City's interesting representatives in the State Legislature, has taken a hand in the effort to regulate automobile racing out of existence. Basing his action on the fatalities which have marked the sport, he has introduced a bill forbidding all such contests or exhibitions and making it a misdemeanor, punishable by a fine of \$500 or one year's imprisonment, for any person, owner, director or agent of a corporation to advertise, present or participate in an exhibition of racing of motor vehicles where the public is admitted with or without compensation. The bill excepts motorcycles and exhibitions on private grounds where no spectators are allowed.

Glidden Would Withdraw His Trophy.

According to reports from Boston, Charles J. Glidden does not relish the proposal that the famous trophy, of which he was the donor, be made to play "second fiddle" in the forthcoming A. A. A. Reliability Tour, which will supplant the Glidden tour. He is supporting the A. A. A. tour and was the first to promise his entry, but he is credited with believing that if the Glidden trophy is to be sidetracked, it should be sidetracked entirely and should be returned to him. His idea is to withdraw the trophy entirely from competition, and if it is returned to him, he proposes to give it to some club or museum, having it properly inscribed and preserved for the good it has done for motoring in America.

Peace Reigns at A. C. A. Special Meeting.

Contrary to anticipations, the Dove of Peace ruled at the special meeting of the Automobile Club of America held on Monday last, 19th inst., and the warring factions smoked the pipe of "compromise," if not of actual "peace." The trouble which arose over the proposed amendments to the constitution and by-laws was smoothed over and a special committee was chosen from members of both factions, which will discuss the proposed changes in the by-

laws giving the governors power to elect officers, and do other things not now countenanced, and will report its decisions obtained by a majority vote. This report will be mailed to all members together with two proxy votes—one for and one against the recommendations of the committee. Another special meeting has been called for March 19, at which the committee's report will be submitted to a vote of the members. Both sides profess to be satisfied with the arrangement. It was also announced during the meeting that at a conference of the Board of Governors, held previous to the special meeting, the resignation of Charles E. Forsdick, secretary of the club, had been accepted by the board and that W. A. Edwards had been appointed temporary secretary.

Chauffeurs Again Attack New York Law.

Apparently in the desire to create more jobs for chauffeurs, the Buffalo Chauffeurs' Club has had one of its members arrested and has retained counsel to test the validity of the New York law requiring chauffeurs to be licensed. The particular end which the chauffeurs' organization hopes to attain is an amendment to the law requiring that owners of cars who now are exempt shall be required to take out licenses as professional chauffeurs, which the chauffeurs' organizations fancies will result in creating more openings in an already crowded field. Only a year ago the various chauffeurs' organizations of the State made a great effort to have the law amended to meet this view, but they failed signally.

New Orleans Racemeet Abandoned.

Though a sanction had been obtained and everything was in readiness, the track meet which was to have been promoted by E. A. Moross in New Orleans on the 17th and 18th inst. was abandoned at the last minute. Lack of entries is given as the excuse for the abandonment. Moross is now in Cuba preparing for a speed carnival to be held there in the near future.

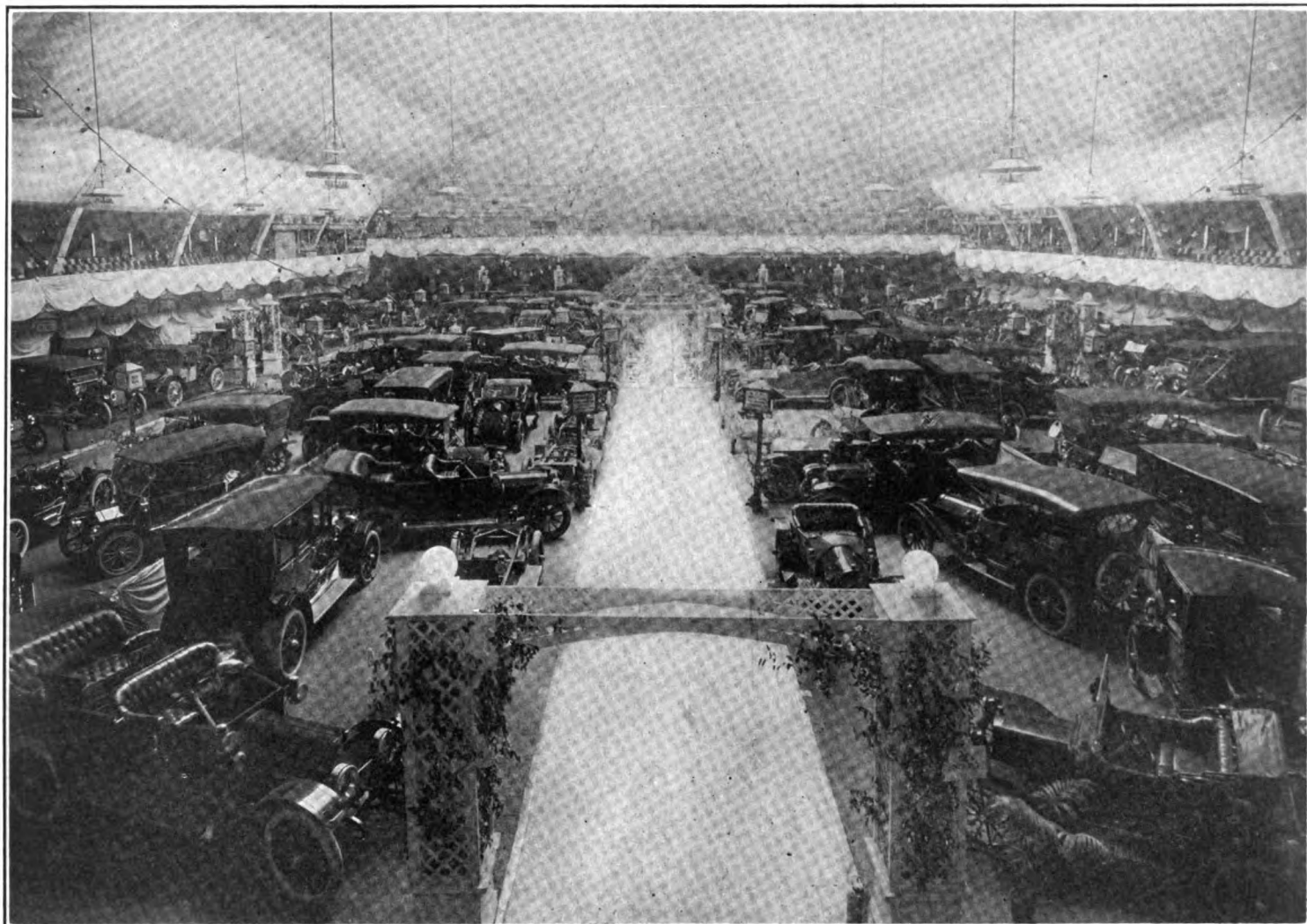
Slow Racing Only at Spokane's Fair.

There will be no more automobile racing at the Spokane, (Wash.) Inter-State Fair. Because of the danger of speeding on the half-mile track which is a part of the Fair association's property, the officials have voted that henceforth all automobile contests shall be slow races, or other "stunty" affairs. Motorcycle speed contests, however, will be continued.

Echo of Elgin Grandstand Collapse.

Dr. Francis W. McNamara, who was injured last summer when the grandstand at the automobile races at Elgin, Ill., collapsed, has filed suit in the Illinois Circuit Court against the Chicago Motor Club, the Elgin Road Race Association and P. A. McHugh, contractor. He asks damages to the amount of \$20,000.

HIGH TIDE ON THE LOCAL SHOW CIRCUIT



GENERAL VIEW LOOKING DOWN THE CENTER AISLE AT THE NEWARK SHOW

New Jersey Dealers, as is Their Custom, Do Themselves Proud

Newark, N. J., is so near to New York that in most things the influence of the big city is distinctly observable. This always has been true even of the automobile shows which annually have been conducted in Newark by the New Jersey Exhibition Co., which is the title under which the dealers operate, and it is true, of course, of the show which was opened in the First Regiment Armory on Saturday last, 17th inst., and which will hold the boards until the end of the present week. It is a credit to the trade and to those immediately responsible for it, of which H. A. Bonnell, manager of the Automobile Board of Trade, who resides in Newark, is the chief.

The show, as usual, is pleasing to look upon. Under a canopy of filmy blue that completely covers the gaunt roof arches, is the tracery of incandescents that loop from

the balconies to the side drop lights, and then in another sweep, to the main chandelier, meeting similar strings from the other side. The blue canopy, the effect of which is emphasized by the starry lights close beneath, is carried clear to the side walls. At one end is a huge fan of blue, pink and white which frames a picture of the "Show Girl." At the opposite end the blue canopy slopes down to meet the balcony, which is concealed by draping of the same color. In the center of the main floor is a lattice summer house, entwined with southern smilax and imitation wild roses; lattice arches at the main entrance and over the entrance to the center aisle similarly entwined carry out the summery effect. The signs which designate the various exhibits, are illuminated with coral colored miniature lamps, the colored rays

from which contrast vividly with the general color scheme.

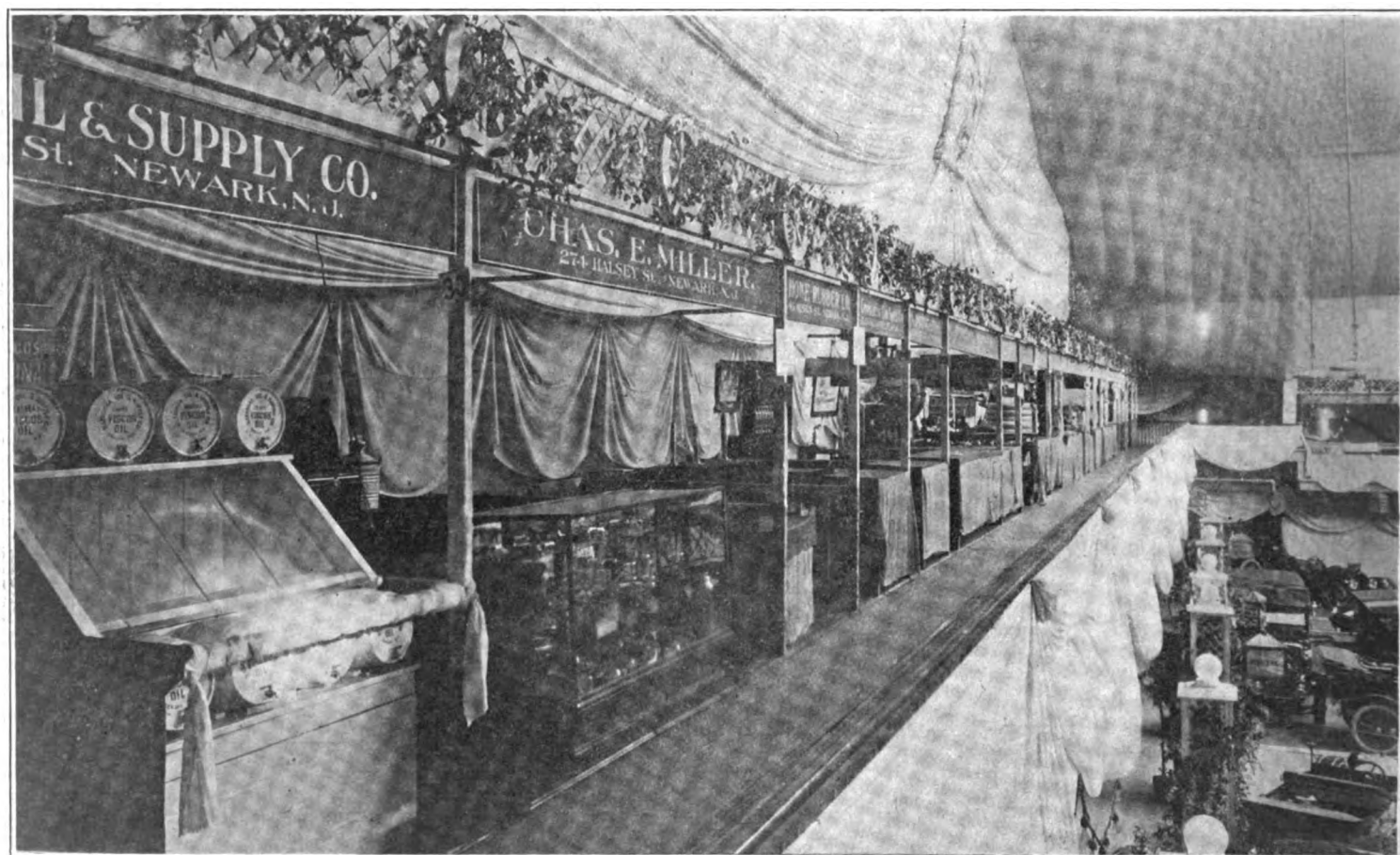
The vehicles, of which 68 different makes are staged by 60 exhibitors, are displayed on the main floor and comprise practically every make of pleasure car made in the country and a couple of imported ones. Commercial vehicles are well represented. The exhibits of 30 accessory dealers are well arranged on the balcony.

Among the car exhibitors are: Van Deman & Wainwright, Abbott-Detroit; F. L. C. Martin Automobile Co., R. C. H., Mitchell, Alco; J. J. Meyer, Auburn; Baker Motor Vehicle Co., Baker electric; Chase & Bradley, Boreland-Grannis; Buick Motor Co., Buick; Detroit-Cadillac Motor Car Co., Cadillac; Paddock-Zuair Motor Car Co., Chalmers; A. G. Spalding & Bros., King, Chase truck; Wallace-DeWilde Co., Cole;

J. W. Mason, Columbia; Hoagland-Thayer, Inc., Commer truck; Commercial Motor Truck Construction Co., Commercial truck; Correia Motor Car Co. of New Jersey, Correja; Lenox Motor Car Co., Crow-Elkhart; Junction Motor Car Co., Cutting; Studebaker Corporation, E-M-F, and Flanders; Newton-Humphryville Co., Everitt; E. D. Carlough, Franklin; R. & L. Co., Garford; Commercial Maintenance and Motor Co., Grabowsky truck, Cunningham Bros., Havers; Haynes Automobile Co.,

Koehler commercial; R. C. H. Corporation, Hupp-Yeats electric; J. M. Quimby & Co., Isotta-Fraschini; Alex Brunner, Kline; Aggar & Aggar, Lion; Greene Motor Car Co., Loconobile; Crescent Automobile Co., Mack truck; Rickey Machine Co., Marmon; J. W. Mason, Maxwell; Van Vleck & Kirby, Metallurgique; New Jersey Automobile Co., Moline; We'don & Bauer Co., National; Newark Automobile Mfg. Co., Newark truck; Oakland Garage, Oakland; Oldsmobile Co. of New Jersey, Oldsmobile;

Detroit; H. Heinaheimer, Palmer-Singer; Peerless Motor Car Co., of New York Peerless and truck; Penn Motor Car Sales Co., Penn; Ellis Motor Car Co., Pierce-Arrow and truck; R. M. Owen & Co., Premier; Reo and Reo truck; Central Motor Car Co., Regal; Crescent Automobile Co., Saurer Truck; J. M. Quimby & Co., S. G. V. and Simplex; A. G. Spalding & Bros., Stevens-Duryea; Stoddard Motor Co., Stoddard-Dayton; Stutz Motor Car Co., Stutz; Newton-Humphryville Co.,



SECTION OF THE WELL ARRANGED ACCESSORY ROW AT THE NEWARK SHOW

Haynes; Herreshoff Co., Herreshoff; A. Elliott Ranney Co., Hudson; H. J. Koehler Sporting Goods Co., Hupmobile, and

Overland Sales Co., Overland; Packard Motor Car Co. of New York, Packard and truck; Empire City Automobile Co., Paige-

Thomas; Empire City Automobile Co., Warren; Linkroom Automobile Co., Winton.

Minneapolis in the Throes of Two Rival and Concurrent Shows

Minneapolis is one of the few cities, if not the only one, which this year is suffering not only an infliction of two rival shows, but two that are running concurrently. The first, under the auspices of the Minneapolis Show Association opened on Saturday, 17th inst., in the National Guard Armory; the other, promoted by the Minneapolis Automobile Dealers' Association, threw wide the doors of the Minneapolis Auditorium Monday, and both will remain in full swing until the end of the week.

Seventy different makes of motor vehicles, of all sizes and all prices are ex-

hibited in the armory and occupy the main floor and basement of the building, while accessories utilize the space afforded by the balcony.

The decorative setting is simple in the extreme, yet withal it is effective. Soft green draperies conceal the ceiling and the walls of the drill hall, except on the side opposite the main entrance where there has been stretched a massive canvas on which has been painted a landscape entitled Minnesota Woods, by J. L. Hall. The clusters of electric lights suspended from the ceiling form by themselves a decorative scheme of no mean degree. The fol-

lowing are the motor vehicles on display: Velie, Ford, Chalmers, Thomas, Paige-Detroit, Case, Speedwell, Bergdoll, Mitchell, Flanders electric, Buick, Stevens-Duryea, Stearns, Maxwell, Columbia, Sampson truck, Luverne, Overland, National, Wilcox, Detroit electric, Rauch & Lang electric, Lozier, Marion, E-M-F, Studebaker electric, Flanders, Inter-State, Cadillac, Packard, Packard truck, Rambler, Gramm truck, Ohio electric, Reo, Marmon, American, R. C. H., Hupp-Yeats electric, Brush, Courier, Waverley, Haynes, Locomobile, Fiat, Lexington, Regal, Westcott, Hupmobile, Pierce-Arrow, Peerless, Columbus

electric, Firestone-Columbus, Kelly truck, Winton, Twin City tractor, Detroit Motor Wagon, Gopher truck, Big Four tractor, Avery truck, Chase truck, Pioneer tractor, Federal truck, Metz, Locomobile truck, Cameron truck, Grabowsky truck, Detroit truck, Detroit.

Thirty-three makes of motor vehicles, nine makes of motorcycles and a considerable complement of accessories constitute the show in the Auditorium. Two of the cars, the Fuller and Union, are new to the show circuit; one from Michigan, the other from Ohio.

Decorations, the consummation of six

weeks' work on the part of the scenic artists, have turned the interior of the building into a palace of beauty. Tall Grecian columns surmounted by clusters of palms and flags and shields of national design support streamers running from the rails of the balconies on either side, while many yards of bunting and cheese cloth, and thousands of electric lights go to render the walls and the ceiling attractive, and the displays bright.

Among the motor cars on view are: Everitt, Krit, Corbin, Amplex, Anhut, Crow-Elkhart, Veerac, Babcock electric, Woods electric, Baker electric, Union,

Cole, Paterson, Oakland, Premier, Halladay, Stoddard-Dayton, Elmore, Warren, Abbott-Detroit, Apperson, Colby, Hudson, Jackson, Fuller, Michigan, Nyberg, White, Penn, Midland, Detroit. The motorcycles displayed are Harley-Davidson, Merkel, Minneapolis, Excelsior, Reading-Standard, Wagner, Indian, Yale, Thor. Accessories are exhibited by: Dahl Punctureless Tire Co., Van Ailburg Co., Baker Demountable Rim Co., Ignition Starter Co., American Starter and Carburetter Co., the Acme Shop, Terry Mfg. Co., Universal Mfg. Co., Dean Electric Co., Stark Sporting Goods Co., Speed Punctureless Tire Co.

Warm Decorations, Also Song, Mark the Second of Pittsburgh's Shows

If the old adage, "music hath charms," can be taken at its face value, there will be no savage breasts at Pittsburgh's second automobile show of the present season. For the exhibition, which opened in the Exposition Hall on Saturday last, 17th inst., under the management of the Pittsburgh Automobile Show Association, has music both vocal and instrumental, including a local soprano, Sousa's famous cornetist, and Arthur Pryor's Band.

The decorative scheme is a "warm" one. The entire floor is covered with a bright scarlet crash, and the draperies adhere to a like tone. The brightness is intensified by the festoons of alternate ruby and white incandescents, which are stretched from the three chandeliers over the center aisle

to the balustrade on the balcony. In the center of the room stands the band stand erected on white imitation granite pillars. The circular platform, 30 feet in diameter, is surrounded by an artistic balcony rail of stucco, its simplicity being relieved by urns of potted plants placed on the supporting posts.

Fifty makes of motor vehicles are exhibited by 32 dealers. The accessory display is meager. The show closes Saturday next, 24th inst.

Among the motor vehicle exhibitors are: Manchester Garage Co., Staver; Miller Auto Co., Crawford; Craig-Center Auto Co., Republic and Marathon; Vestal Motor Car Co., Curtis truck; Forbes Auto Co., Warren and Stutz; Hale Auto Co., De

Tamble; Pullman Motor Car Co., Pullman; Schacht Motor Car Co., Schacht; L. G. Martin, Pamblar; Abbott-Detroit Sales Agency, Abbott-Detroit; Penn Motor Car Co., Penn; Pittsburgh Automobile Co., Oakland and Commer truck; State Automobile Co., Dorris; B. F. Benson, Moon; Richardson-Neighbors Motor Co., Hupmobile; Bessemer Motor Truck Co., Bessemer truck; West Penn Automobile Co., Kelly truck; William Hasley Motor Car Co., Mitchell; Cole Motor Car Co., Cole; International Motor Co., Saurer truck; Aaron DeRoy Motor Car Co., E-M-F and Flanders; Federal Motor Car Co., Oldsmobile, Ohio, and Mais truck; Palace Motor Car Co., Palace; Robert C. Gormly, Paige-Detroit.

Hartford Showers Flowers and Favors from Flag at Its Opening

The fifth and banner exhibit of the Hartford Automobile Dealers' Association, in the Hartford (Conn.) State Armory, was opened Monday last, 19th inst., with more than usual ceremony. The mayor pressed a button which flooded the hall with the glow from several thousand electric lights, the orchestra struck up the Star Spangled Banner, an a huge American flag gradually unfurled and from its numerous folds dropped flowers and favors upon the entering crowd. And there was much for the crowd to see.

There are 65 makes of motor cars, and some 15 commercial vehicles, staged by 48 dealers, which are displayed to great advantage under the skies of sunny Italy, amid a beautiful garden crossed and re-crossed with pergolas laden with clusters of ripening grapes, which partially conceal the varicolored incandescent lamps which glow softly through the foliage of the arbors. All paths, however, lead to the center of the drill hall, where a circular enclosure, bounded by lattice work arbors, beneath which are placed benches of imitation marble and which add a touch of the ancient Roman to the otherwise modern Italian setting. In the center of the open space stands a massive column, 50 feet

high, surmounted by a huge globe, resting in a recess in the Doric capital. The column is supported on a rectangular base of proportions suitable to show it off to the best of advantage. Overhead the dome of the armory is concealed by thousands of yards of blue cloth, while the walls are draped in white. The exhibits are spaced by boxwood trees connected with silk ropes, the booth numbers being designated by a green shield supported by the rope.

Three vehicles, new to the 1912 show circuit, are displayed, the Sibley-Curtiss roadster, a four-cylinder, 25-horsepower machine selling at a moderate price, the product of the Sibley-Curtiss Motor Co., of Simsbury, Conn.; the Stanley Steam Car, handled in Hartford by A. D. Scoville, and the Moeller truck, the product of the New Haven Truck and Auto Works. Naturally the local manufacturers of motor cars, the Columbia Motor Car Co. and the Pope Manufacturing Co., have particularly comprehensive displays.

The show will close on Saturday night, 24th inst.

Among the car exhibitors are: Electric Auto Station, Flanders electric; Alpena Motor Car Co., Raffle; F. J. Caulkins, Buick; F. W. Williams, Metz; F. H. Strong,

Schacht; G. P. Brainard, Cole; W. N. Wetherell, Stoddard - Dayton; Columbia Motor Car Co., Columbia; Winton Motor Car Co., Winton; R. D. & C. O. Britton, Maxwell and Federal truck; Palace Auto Station Co., Flanders, E-M-F, Thomas, Oldsmobile and Waverley electric; J. T. Curtiss Co., Sibley-Curtiss; Dunbar Motor Car Co., Elmore; Knox Auto Co., Knox; Packard Motor Car Co., Packard; B. M. Spencer, Kissel; Kilby & Barrett, Matheson; Brown, Thompson & Co., Stevens-Duryea, Lozier and Cadillac; Capitol City Auto Co., Mitchell; Russell Tabor, Reo; J. A. Palmquist, Pratt-Elkhart; Andrew Cassky, De Tamble; Fisk Garage, Marion; J. J. & F. Ahern, Abbott-Detroit; New England Garage, Cutting; Miner Garage Co., Pierce-Arrow and Corbin; Pope Mfg. Co., Pope; Elmer Auto Co., Ford; Carl H. Paige Associates, Chalmers; S. A. Foster & Co., Regal and Rambler; Electric Auto Station, Baker electric; Edred Clark, Paige-Detroit; F. A. Law Machine Co., National; E. H. Harris, Overland and truck; George L. Kaiser, Empire; George D. Knox, Peerless and Hudson; Skinner Bros., Stearns; A. H. Eddy, Cartercar; Buick Garage Co., Buick, Alco and R. C. H. and Hupp-Yeats electric; M. T. Hill, Hay-

ers; A. D. Scoville, Stanley Steamer; Fred E. Purington, Marathon; S. A. Foster Co., White truck; New Haven Truck and Auto Works, Moeller truck; Hartford Electric Light Co., General Vehicle; Atterbury Truck Co., Atterbury.

The accessory exhibitors are: Dahl Punctureless Tire Co., tires; Brisbie Motor Co., motors; Hartford Auto Parts Co., ac-

cessories; Todd Rubber Co., tires; Di-Motor Co., accessories; Auto Tire Co., tires; Richardson Tire Co., tires and sundries; E. R. Clark, pumping and power plant; O. D. Cornell, lighting outfit; Baldwin & Stuart Electric Co., electric specialties; Universal Auto Repair Co., sundries; Connecticut Oil Co., oils; Wayne Oil Tank and Pump Co., fuel and lubricant storage

system; G. W. Fuller, leather goods; Charles E. Miller, accessories; Post & Lester, supplies; Alling Rubber Co., rubber goods; The Lathrop Co., sundries; The Welding Co., autogenous welding; Connecticut Steel and Wire Co., sundries; Finch & Hayes, motorcycles; Smith Worthington & Co., leather goods; Aetna Insurance Co., insurance; Blue Ribbon Garage, sundries.

Electrics Share Honors With Gasolene Cars at the Cleveland Show

With the opening of the tenth annual automobile show in Central Armory on Saturday evening last, 17th inst., under the auspices of the Cleveland Automobile Club, what may be termed a third, or rather a return to the first epoch, in the history of Cleveland "showology," was inaugurated, which is to say that the two factions which for several years past have held separate shows, have buried the hatchet and again are displaying under one roof.

Naturally the show is large; 44 makes of motor vehicles shown by 42 exhibitors, and a full complement of accessory exhibits, some 28 to be specific, filling the building close to the overflow mark. "Electrics"—for Cleveland can safely be called one of the godmothers of the electric vehicle—form no mean proportion of the total number of the motor car exhibits; the products of the Baker Motor Vehicle Co., Broc Electric Vehicle Co., Rauch & Lang Carriage Co., in the electric field, while of gasolene vehicles, it goes almost without saying that the productions of those famous Cleveland manufacturers, the Winton Motor Carriage Co., White Co., F. B. Stearns Co., and Peerless Motor Car Co., are very much in evidence, and, as usual, the Stearns-Knight engine is a center of attraction.

Color is not lacking in the decorative scheme, neither is it subdued in tone. The Oriental palace impression which is created

at first by the Turkey red draperies which, together with mountain laurel, cover the walls and the ceiling of the armory, is augmented by the myriad electric lights, both arc and incandescent, which illuminate the drill hall, as well as by the contrasting colors of the polished automobile bodies. The rather large assemblage of motor vehicles will be on view until the show closes next Saturday evening.

Automobile exhibitors: New York Simplex Distributors, Simplex; States-Cleveland Motor Co., Stoddard-Dayton, Brush and Courier; Ford Motor Co., Ford; Thomas B. Jeffery Co., Rambler; American Motor Car Co., American; F. B. Stearns Co., Stearns; The White Co., White; Broc Electric Vehicle Co., Broc electric; J. C. Koepke, Cutting; R. C. H. Corporation, R. C. H. and Hupp-Yeats electric; Reo Motor Sales Co., Reo; A. R. Davis Motor Co., Flanders, E-M-F, and Studebaker and Flanders electrics; Franklin Automobile Co., Franklin; Jackson Motor Co., Jackson; Western Reserve Motor Car Co., Garford, Marion and Regal; Baker Motor Vehicle Co., Baker electric; Parrish Motor Car Co., Parrish; V. R. Hall Automobile Co., Cartecar; Rauch & Lang Carriage Co., Rauch & Lang electric; Weaver-Sealand Motor Co., Everitt and Pierce-Arrow; Olds-Oakland Co., Oldsmobile and Oakland; J. M. Rauch Motor Sales Co., Krit; Euclid Auto-

mobile Co., Firestone-Columbus and Columbus electric; Barger Automobile Co., Cadillac; Lozier Motor Co., Lozier; Lucas & Christenson, Mitchell; Richardson-Neighbors Motor Co., Hupmobile; E. D. Finch, Chalmers; United Motor Cleveland Co., Columbia & Maxwell; Peerless Motor Car Co., Peerless; Buick Motor Co., Buick; Auto Sales Co., Overland; Winton Motor Car Co., Winton; Pullman Motor Car Co., Pullman; Ohio Motor Car Co., Ohio; Standard Electric Car Co., Standard electric; Henderson Motor Sales Co., Henderson; Banting Machine Co., Paterson; Park Motor Car Co., Metz; Windermere Garage Co., Stutz.

Accessory exhibitors: Perfection Spring Co., Electric Products Co., O'Neil Tire Protector Co., Ohio V-Ray Sales Co., Julius E. Strater, Leader Mfg. Co., Lister Motorcycle Co., Portage Rubber Co., Kumler Bros., Casino Cycle and Supply Co., Standard Oil Co., L. J. Mueller, Cleveland Automobile School Co., The MacAdams Co., Yale Cycle and Supply Co., B. & B. Mfg. Co., Viscos Motor Oil Co., Wayne Oil Tank and Pump Co., Auto Appliance Co., National Motor and Supply Co., National Refining Co., Cleveland Hardware Co., Columbia Refining Co., Charles E. Miller, The Bailey Co., Automatic Vulcanizer Sales Co., C. A. Griesse, H. W. Johns-Manville Co.

Baltimore Begins Its Two Weeks' Session With Lots of Light and Color

Part I of the annual show held under the joint auspices of the Baltimore Automobile Dealers' Association and the Baltimore Automobile Club, was inaugurated in the Fifth Regiment Armory on Tuesday evening, February 20th, and will be superseded next week by the commercial vehicle section, which will round out a period of activity that will serve to satisfy the Maryland appetite for automobile shows for some time to come.

The feature of the decorative scheme is the massive chandelier hung directly in the center of the drill hall. The numerous bulbs which go to make up the piece, are arranged so as to form a hemisphere of light; a mammoth reflector placed above the chandelier tends to diffuse the rays so that no booth is slighted in the distribution of illumination. To further add to the brilliancy of the hall, an ornamental

pillar bearing a cluster of tungsten lamps has been placed in each corner. The walls are covered with green and white bunting, the monotony being relieved by a design embodying the American colors, alternating with the State colors, and the black and gold wheel, the emblem of the Baltimore Automobile Club.

Of the 44 automobiles staged by 37 exhibitors one, the Sporer made by Carl Sporer Sons & Co., is a local product. Motorcycles, nine different makes, are shown by five dealers, while accessory row is fairly well filled with the wares of seventeen exhibitors.

Among the exhibitors are: Atkinson & Calahan, Locomobile; Calahan Bros. Co., De Tamble; H. H. Babcock Co., Babcock electrics; Everitt Auto Co., Everitt; Auto Outing Co., Buick; White Auto Co., White and Abbott-Detroit; Winton Motor Car-

riage Co., Winton; L. M. Vordenberg Motor Co., Columbia and Maxwell; Zell Motor Car Co., Chalmers and Peerless; Oakland Motor Co., Oakland; G. A. Pope, Jr., Simplex; Rice Bros., C. G. V., F. W. Sandruck, American; Foss-Hughes Co., Pierce-Arrow; Ford Auto Co., Ford; Franklin Auto Co., Franklin; Mar-Del Mobile Co., Packard; Model Automobile Co., Pullman; Mount Vernon Motor Co., Kissel; Motor Car Co., Overland and Stevens-Duryea; C. R. Misner, Oldsmobile; Neely & Ensor, Alco and Kline; D. C. Walker Auto Co., Cole, Stearns, E-M-F and Flanders; Norwood Bros., Elmore; Standard Motor Co., Cadillac; Carl Sporer's Sons, Sporer; Stoddard-Dayton Auto Co., Stoddard-Dayton; F. C. Latrobe, Fiat; Lozier Sales Co., Lozier; Lambert Automobile Co., Hudson; International Harvester Co., International; Cooper & Sinclair, Moon;

Schaffer Mfg. Co., R. C. H.; Schall & Crouch Auto Co., Paige-Detroit; Walter Scott, Marmon; J. S. Ditch & Co., Detroit electric.

Accessory exhibitors are: Auto Supply Co., Carbolide Chemical Co., Baltimore Buggy Top Co., Callihan Bros. Co., Charles

Elliott & Co.; Elastic Wheel Co., Auto Co. of Maryland; Automobile College, F. Hemmeter & Sons, John C. Raum & Son, Maryland Motor Car Insurance Co., R. R. W. Thompson. Standard Oil Co., Maryland Electric Supply Co., Indian Refining Co., Keystone Lubricating Co., and F. C. Lat-

robe. Motorcycles are exhibited by: Chase Motor Co., Harley-Davidson; Little Joe Wiesenfeld, Yale and Thor; Howard A. French & Co., Indian; F. W. Sandruck, Merkel, Excelsior and Emblem; Randall Mfg. Co., Pope-Columbia and Reading-Standard.

Cincinnati Sets Its Show in a Southern Garden With Violet Draperies

Monday last, 17th inst., marked the Cincinnati Automobile Dealers' Association's second venture in the show field, when 38 motor car exhibitors staged some 58 machines in Music Hall. Those machines which are exhibited on the lower floor of the building are shown to great advantage amid a Southern Garden setting. The soft violet draperies with which the walls are covered, contrast with the green of the imitation grass and make a very effective background for the machines. The upper floor where several cars and the accessories are displayed, glows with the warmth of the deep crimson bunting which covers the walls save where several panel paintings are placed. The paintings depict the several most important steps in the development of the automobile.

Pleasure cars only will be exhibited until Monday next, 24th inst., when the opening of Part II of the exhibit will give the dealers ample opportunity to exploit com-

mercial vehicles to the best advantage.

Among the exhibitors of motor cars are: Fisher Auto and Service Co., Speedwell and Fiat; Citizens' Motor Car Co., Packard; Olds-Oakland Co., Oldsmobile, Oakland and R. C. H.; Leyman-Buick Co., Buick; Herschede Motor Car Co., Rauch & Lang electric; Krause Motor Car Co., Maxwell and Marmon; R. C. Crowthers Co., Elmore and Alco; Charles Behlen Sons & Co., Locomobile and Detroit electric; George C. Miller Sons Co., Stevens-Duryea; Hanauer Automobile Co., Pierce-Arrow; Jungclas Auto Co., Overland, Thomas and Baker electric; Charles Schiaer Motor Car Co., Hupmobile, National and Apperson; Heilemann Auto Co., Haynes and Cartercar, Acme Auto Co., Flanders, E-M-F and American; J. H. Ratliff Auto Co., Chalmers; Stevens-Costello Co., Stutz, Moon, and Dayton electric; Franklin Automobile Co., Franklin; Cincinnati Automobile Co., Peerless, Pope-Hartford and

Everitt; Dr. H. C. Wendell, Dorris; Payne Motor Co., Hudson and Lozier; Haberer & Co., Cino; Imperial Motor Car Co., Stearns and Broc electric; Ohio Motor Car Co., Ohio; Rose Hill Garage, Ohio electric; Cadillac Motor Sales Co., Cadillac; Welland Co., Columbus electric; H. A. Langland, McFarland; Eddy Auto Co., Case; L. C. Dennison, Winton; F. B. Williams Co., Jackson; Schacht Motor Co., Schacht; Ratterman Motor Co., Krit; Herold Motor Co., Reo and Premier; Selden Auto Agency, Selden; S. G. Gildehaus, Cunningham; Brendamour Sporting Goods Co., Babcock electric; Chadwick Motor Co., Chadwick; Waverley Electric Garage, Waverley electric.

Accessories are shown by: Coughlin & Davis, Bümiller & Remelin Co., Moore Oil Co., Wayne Oil and Tank Co., Paragon Refining Co., Perfection Lighting and Storage Co., Pyrene Sales Co., All-Sides Clean Co., and Andrews Mfg. Co.

Thoroughly Representative Display of Cars and Trucks at Omaha

Fifty-eight brands of motor cars, staged by 33 exhibitors, 16 exhibits of commercial vehicles, and five displays of accessories constitute the Omaha Dealers' Association's ninth annual show which will occupy the handsomely decorated Auditorium until Saturday next. When it opened on Monday, 17th inst., the exhibitors and the cars which they displayed to advantage lined up as follows:

Apperson Auto Co., Apperson; Bradley, Merriam & Smith, Imperial and McIntyre; Cadillac Auto Co., Cadillac; Cartercar Nebraska Co., Cartercar; J. I. Case Threshing Machine Co., Case; John Deere Plow Co., Velie and truck; Deright Auto Co., Locomobile and White truck, Stod-

dard-Dayton and Waverley electric; Electric Garage Co., Packard, Rauch & Lang, Baker and Flanders electrics and Packard truck; Freeland Auto Co., Mason and truck; Ford Motor Co., Ford; Fredrickson Auto Co., Pierce-Arrow, Chalmers; W. L. Huffman Auto Co., Hupmobile, Abbott-Detroit, Hupp-Yeats electric; Inter-State Auto Co., Inter-State; R. R. Kimball, Stevens-Duryea, Stanley Steamer and Reo; Lininger Implement Co., R. C. H. and Oakland; Marsh Auto Co., Premier and E-M-F; Mitchell Motor Co., Mitchell and Lozier; Andrew Murphy & Son, Detroit electric; Marion Auto Co., Marion, Marmon and Ohio electric; Moline Auto Co., Moline; Nebraska Buick Auto Co., Buick

and Marquette; T. G. Northwall, Brush, Detroit and Courier, and Atterbury truck; Omaha Auburn Auto Co., Auburn; Pioneer Implement Co., Jackson; Rambler Motor Co., Rambler; Guy L. Smith, Franklin, Hudson and Peerless; Jack Sharp, Alco and truck; Studebaker Corporation, E-M-F and Flanders; Traynor Auto Co., Cutting and National; United Motor Omaha Co., Maxwell and Columbia; Van Brunt Auto Co., Overland, Pope-Hartford and Ohio electric; E. R. Wilson Auto Co., Lexington and Paige-Detroit; Wallace Auto Co., Stearns. Accessories are exhibited by: Baum Iron Co., Omaha Rubber Co., Powell Supply Co., Storz Auto Supply Co., Western Auto Supply Co.

New York Town Demonstrates That Six Dealers Can Make a Show

Six tailors may or may not be able to make a man, but the Binghamton Automobile Dealers' Association is this week demonstrating that it is possible for six dealers to make an automobile show. That number constitutes the exhibition which opened in the armory in the New York upstate city on Tuesday last, 20th inst., the building being tastefully dressed in the national colors and set off by numerous large baskets of flowers suspended from the ceiling, which contributed a sort of hanging garden

effect. Despite the comparative few and far between-ness of exhibits and exhibitors, the good people of Binghamton are in no wise cast down. To them the show is one of the events of the year and they flock to it accordingly and as if it was as big as all outdoors.

Although there are but six dealers displaying their wares, there are 20 different brands of automobiles in evidence. There are also three displays of motorcycles, the full list of exhibitors being as follows: Lowell,

Hammond & Warden, Marmon, Winton, Westcott, Pullman, E-M-F, Flanders; Purdy & Mix, Overland, Velie and Hupmobile; Binghamton Motor Car Co., Buick and Thomas; S. H. Lewis & Co., Columbia, Franklin and Maxwell, and Sampson and Chase trucks; June Automobile Co., Mitchell, Chalmers and Brush; Binghamton Cadillac Co., Cadillac. Motorcycles are shown by: Turner's Bicycle Store, Harley-Davidson, Pierce and Emblem; B. E. Jewell, Excelsior; E. C. Campbell, Flanders.

DEMOUNTABILITY THAT IS RADICAL

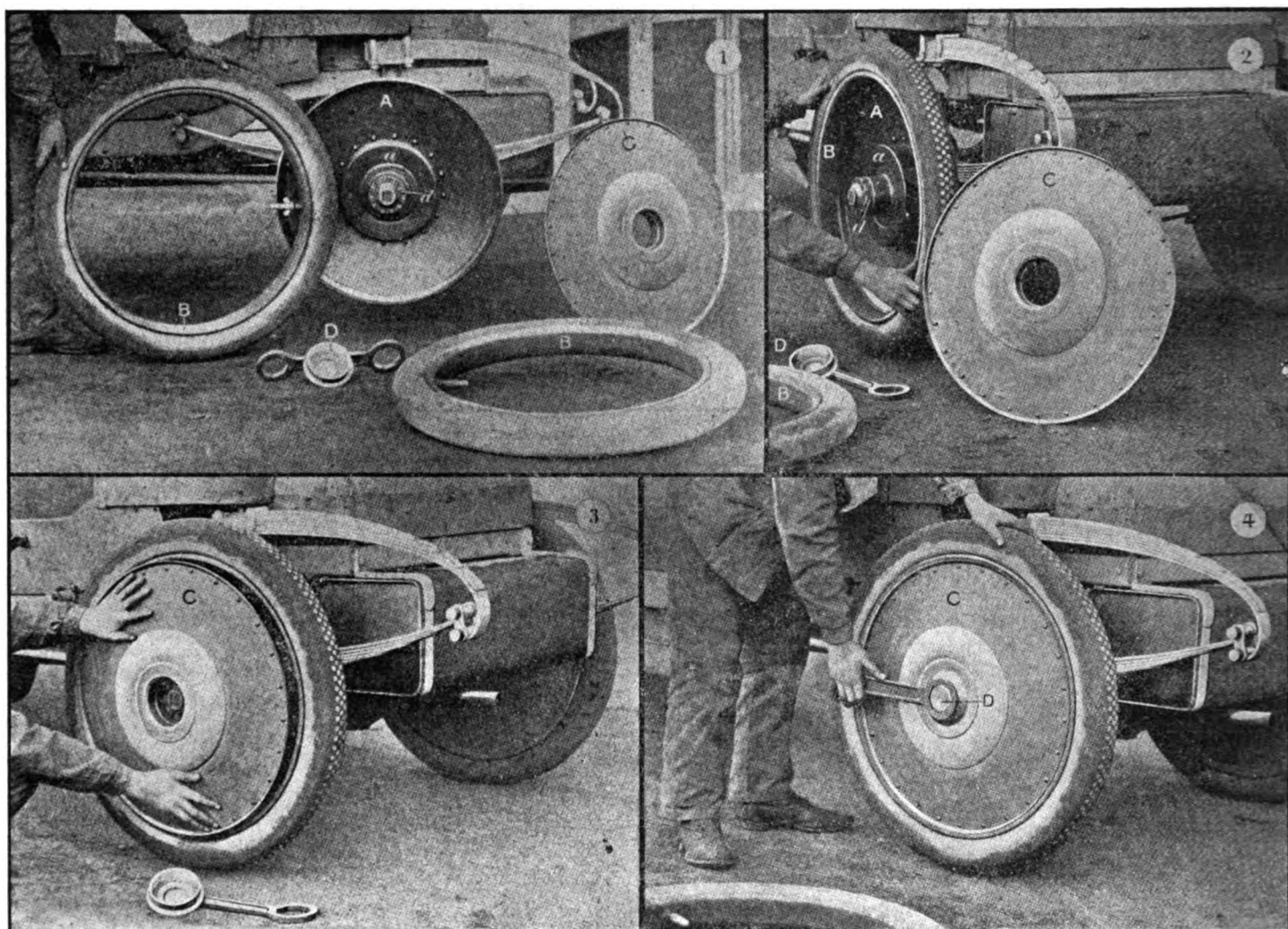
Frenchman Evolves a Disk Wheel Comprising But Three Parts—Its Advantages and Its Disadvantages.

Due probably to the concentrated effort which foreign automobile manufacturers have given the production of removable wheels, little attention has been directed to the possibilities of demountable

corporate a number of features that are so unusual as to make it of uncommon interest.

It is styled the d'Hespel wheel for its inventor, M. d'Hespel, and as may be seen in the accompanying illustration is so simple as to consist of but three parts, not including the wrench, which is the only tool required to remove a rim and tire. In its simplest aspect it is merely a disk wheel, though it differs from those few disk wheels which have made their ap-

Though the wheel undoubtedly possesses advantages which are peculiar to it, not the least of which are its extreme simplicity and the facility with which a rim may be removed, it also has disadvantages. As the inside disk is the only one which is driven and as there is nothing except the frictional contact between a narrow section of the disk and the tire rim to transmit the drive to the road it might be questioned whether it actually will stand the strain of extended use over other than smooth roads.



CONSTRUCTION AND OPERATION OF THE NEWEST TYPE OF FRENCH DEMOUNTABLE RIM—THE D'HESPEL
1—Showing inner and outer disks with rim removed. 2—Rim in place on the inner disk. 3—How the removable disk is replaced. 4—Method of fastening outer disk and rim.

rims and as a result they have not attained to anything like the popularity which they have acquired in America. The French have been particularly slow in the acceptance of the removable wheel, although within the past month, considerable impetus has been given the movement by the formation of a company styled the Societe Francaise des Roues Amovibles, which, as its name suggests, will devote its energies to the manufacture and sale of demountable wheels. As a further indication of the gaining popularity of such devices there subsequently has appeared on the French market a brand new style of demountable rim and wheel which is a radical departure from all others of that type, and which in-

pearance in the past in that there is no wheel felloe, strictly speaking, its place being taken by the rim (B) on which the tire itself is mounted. The inside disk (A) is the driven member, the method of driving being quite similar to that which is used in the ordinary type of wheel mounted on a full floating axle in which the axle is attached to the wheel and drives it through a dog clutch (d). To remove a rim, it is merely necessary to take off the hub cap (D) which releases the outer disk (C) when the rim and tire may be slipped off. Another of the interesting points of the wheel is that the brake drum (a) is enclosed between the disks, the brakes being of the internal expanding type.

Also, experience has taught that where vibration is present either an exceptionally tight ground joint, or some other means of effectually sealing the connection between two bodies are the only means which can be relied upon to ensure the exclusion of dirt and water. A ground joint between the removable disk and the tire rim is impossible, of course, if for no other reason than that any one of a number of rims may be put on and no two of them can be so precisely alike as to fit a ground surface on the disk, though it is possible that some other means might be employed to keep road dirt out of the space between the disks, which otherwise must serve as a catch-all.

ROTARY MOTOR THAT REALLY WORKS

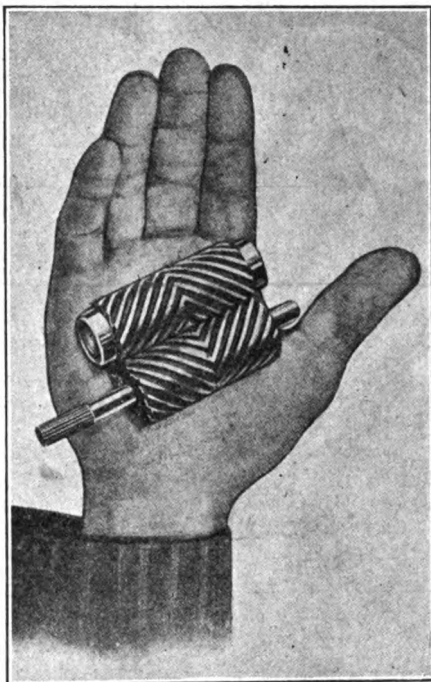
Buffalo Invention That is in Every-Day Service—Employs Steam but Holds Possibilities for Gasolene.

Notwithstanding the wonderful improvements that have been made in the gasolene engine since it first was applied to the driving of motor cars, it still falls far short of being a really ideal motor because of its embodiment of the reciprocating principle, which introduces difficulties that can be only partly overcome. A motor involving rotary motion only is considered as the most desirable form, hence the great amount of attention devoted to such motors and those of the turbine principle. Owing to the very great difficulty of producing continuous internal combustion under pressure, however, rotary motor development has been confined chiefly to engines working under steam pressure, and interest in this direction has been greatly stimulated by the recent invention of a "pocket-edition" steam turbine by Nikola Tesla, whose reputation coupled with his declaration that he readily could adapt it to gasolene uses, caused the automobile trade to "take notice." Because of its probable effect on the development of the gas engine of the future, experiments in steam rotary motors are extremely interesting, which applies with especial force to one devised by John H. Van Deventer, which is illustrated herewith, and which is uncommon in that it is the invention of a practical man and has been in actual service for an extended time.

The motor is of the simplest possible type, its entire moving mechanism consisting of two gears of the "herringbone" type with faces that are extremely wide in proportion to their diameter. There being no reciprocating or unbalanced parts, the motor is of the true rotary class, eminently adapted to run at the highest speeds and therefore capable of producing great power for a given size and weight. The inventor, who is superintendent of the Buffalo Forge Co., has given his device the name "Spiro," taking it from the spiral form of the "teeth" of the rotors. There is nothing very new about the "Spiro" motor to Van Deventer or to the Buffalo Forge Co., in whose shops one of these motors, rated at 186 horsepower, has been in constant use for three years without overhauling—in fact, without mechanical grooming of any kind.

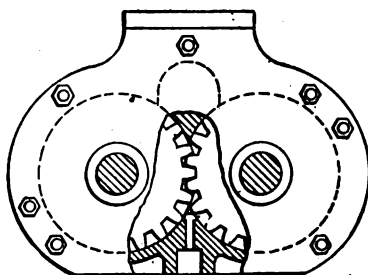
The two spiral gears which constitute the working part of the motor are enclosed in a casing which fits closely around the rotors, forming what amounts to two cylindrical bores with an opening between them, the opening being at the point where the teeth of the gears come together. On the intake side, or the side where the steam

is admitted, there is a narrow opening which discharges steam against the gear teeth as near as possible to the center. The exhaust openings are peculiarly arranged. If the gears were of the spur type, with the teeth parallel with their axes, as in the familiar gear pump used for circulating the cooling water in the jackets of gasolene motors, the steam would be ex-



SPIRO HERRINGBONE GEAR ROTORS

hausted directly opposite the intake port. In the "Spiro" motor, however, the two teeth of each pair make contact first at the center, and the points of contact run along from the center towards the ends where the teeth finally separate. As the steam cannot exhaust until the teeth separate, it follows that the point of exhaust is



SPIRO ROTARY STEAM ENGINE

at the ends of the teeth and so the exhaust chambers are at the ends of the gears and they communicate with a common passage which empties into a port through the casing and so into the usual exhaust pipe.

It would appear that the action of the Spiro motor is partly that of a turbine, in which the rotors are driven by the impact of steam, issuing from nozzles at high velocity, upon blades, and partly of the sort in which the pressure of the steam does the driving, regardless of its velocity. Each pair of teeth may be likened to a lit-

tle piston. The steam presses against the teeth at the point of contact, seeking to escape into the area of lower pressure—the exhaust chambers at the ends of the gears—but in order to reach these chambers the rotors must be turned until the teeth separate and allow the steam to pass out. The action may be better understood if the rotors or gears are considered as worms or screws of very steep pitch. Pressure applied to one thread of the screw, in a direction parallel with its axis would cause it to rotate until the end of the thread was reached by the pressure-applying medium. In the Spiro the pressure of the steam acts just in this way, only that it exerts its pressure at two opposite points which rapidly diverge as the gears rotate. The different teeth, of course, take up the work as they come into the area of pressure, and there are as many "piston equivalents" as there are teeth in contact. There is no end thrust because the pressure toward one end is exactly balanced by the pressure toward the other. There is considerable unbalanced pressure on the intake side, however, because there is live steam exerting force on the rotors at this point and only the low pressure of the exhaust on the opposite side. This thrust is continuous and in direct proportion to the pressure of the steam admitted, and is taken on the bearings, which are made sufficiently large to take care of it. In order to slightly offset the unbalanced pressure the steam is admitted from underneath, so that the pressure that must be carried by the bearings is decreased by the elimination of the weight of the gears. Particular attention has been given to the lubrication of the bearings, and, without the use of extra or external apparatus, each bearing is made to keep itself supplied with oil under pressure, so that the film of oil between the journal and the bearing is maintained unbroken. It is necessary that the lubrication system should be carefully worked out because the high velocities employed would otherwise result in an excessive amount of friction in the bearings.

Motors have been built in various sizes up to the 186 horsepower unit that has been in service at the Buffalo Forge company's plant. The smallest, having rotors so small that both can be held in the palm of the hand and hidden when the fingers are closed over them, has been used in a hand drill, and, tiny though it is, it proved capable of drilling a quarter-inch hole into cast iron at the rate of an inch in twelve seconds. A five horsepower motor can be kept in motion by the four ounces steam pressure that can be generated in a common tea-kettle, which gives a good idea of the small amount of steam and pressure required for its operation.

Preparations are under way for placing Spiro motors on the market, and they will be built in sizes running from the little hand drill type up to several hundred horsepower.

EMPLOYING KEROSENE FOR FUEL

Another Device That Seeks to Overcome the Old Difficulties—Ingenious Method of Heating the Kerosene.

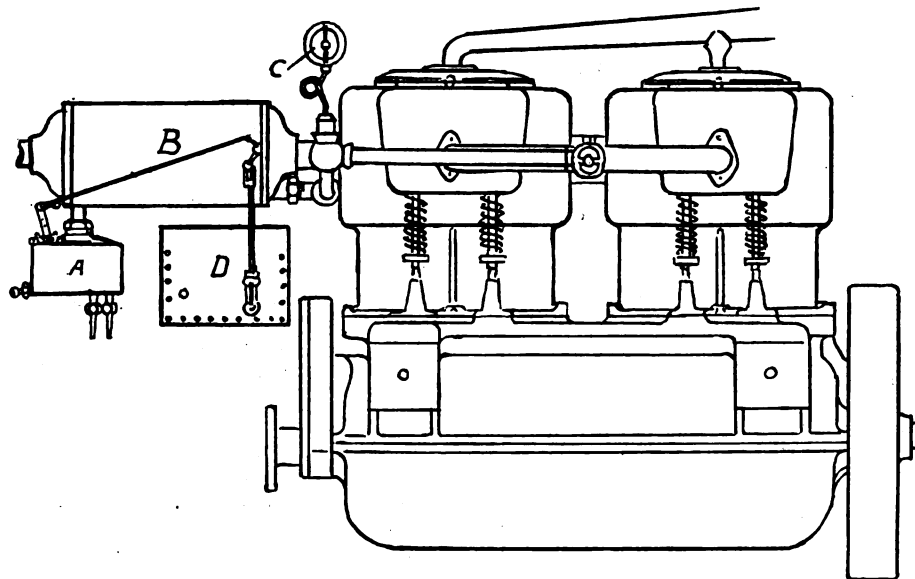
If gasolene continues indefinitely to be the standard fuel for automobile motors it will not be for lack of efforts to supersede it by the cheaper, if more refractory, kerosene. So far as the production of power is concerned, kerosene is somewhat the superior of gasolene, but unfortunately it refuses to be properly gasified unless made very hot. Therefore all appliances for vaporizing kerosene begin with

end of the coil of copper pipe is connected to a carburetter, A, which has two feed connections, one for kerosene and the other for gasolene, and the other end is piped to the main air intake of the regular carburetter of the motor. These parts constitute the gas producing elements. In operation, the kerosene supply to the carburetter A is shut off and the gasolene turned on, when the motor is started in the usual way and is allowed to turn until the coil of pipe in the producer has had time to become thoroughly heated, which takes from three to five minutes, according to the size of the motor, a large installation requiring, of course, somewhat longer than a small outfit. When everything is hot, the gasolene is shut off and the kerosene

of the motor. It has been found that the kerosene requires considerably more air than the gasolene for perfect combustion. The air openings are set to give the proper mixture for running on kerosene, but when gasolene is used the level is higher at the spray nozzle, because the regulating float sinks deeper into the liquid, and consequently a sufficient quantity of gasolene is passed to form a mixture that is slightly on the rich side—which, however, is a matter of little or no moment because the total quantity used is small and, as a matter of fact, the effect is advantageous in that it heats the coil more rapidly than would a more perfect mixture.

While the kerosene gas producer in its standard form is built in this way, with arrangements for manual control, it also is made with attachments which make it entirely automatic. No more attention is given to the motor than if it had a straight gasolene carburetter; it is cranked as usual, starts on gasolene, and automatically switches over to kerosene at the proper time, and if for any reason the temperature drops the gasolene will be switched back into the line. When the motor is stopped the kerosene supply remains open until the temperature falls below the critical point, when the gasolene supply automatically replaces it. This is accomplished by adding a thermostat which takes the place of the thermometer and performs the functions of a temperature indicator as well as of a regulator. The casing D contains electro magnets which operate, through suitable rods and bell-cranks, a heat-regulating butterfly valve in the producer and the two valves controlling the supply of fuel of both kinds. When the heat rises to the proper point the thermostat makes an electrical contact, energizing the magnets, which turn off the gasolene, turn on the kerosene and partly close the heat valve, acting through the connections shown in the drawing. If the gases begin to cool, the thermostat, contracting, first fully opens the heat valve and, if the cooling still continues, turns off the kerosene and restores the gasolene to the carburetter in time to keep the motor running smoothly. Four dry cells are sufficient for the operation of the magnets.

A demonstration outfit has been installed in the basement of the building in which the company's New York offices are located, and though the ventilation is not of the best, the exhaust, when the motor was seen running on kerosene, made no more than a very slight haze—just what might have been expected from gasolene under the same conditions. The motor started very readily on the kerosene vapor when hot, and when changed over from gasolene after being started cold, the speed increased perceptibly. This, it was explained, was due to the fact that the kerosene vapor ignites and burns very rapidly, giving the same effect as if the ignition had been slightly advanced.



KEROSENE GAS PRODUCER AND ITS METHOD OF ATTACHMENT

the application of heat in some way, and it is necessary to regulate the heat,

Giving evidence of no little ingenuity in the manner in which heat is applied and regulated, the apparatus brought out by the Universal Oil Converter Co., whose sole agent is the Kerosene Gas Producer Co., of 1926 Broadway, New York, is designed to be applicable to any gasolene motor, either two-cycle or four-cycle. The manufacturers guarantee that three-quarters of a gallon of kerosene will do the work of a gallon of gasolene—that is, a motor that will use, for example, a gallon of gasolene per hour will develop the same power for the same length of time on three-quarters of a gallon of kerosene.

The vital portion of the converter is a sheet metal shell, B, having much the appearance of a muffler with round ends and the usual openings at either end for pipe connections; the shell is heavily lagged with a heat-retaining jacket. Inside is a coil of thin-walled copper tubing, there being approximately 20 linear feet of pipe. The exhaust gases from the motor pass through this chamber, being piped in at one end and out of the other, and circulate freely around the coil, heating it. One

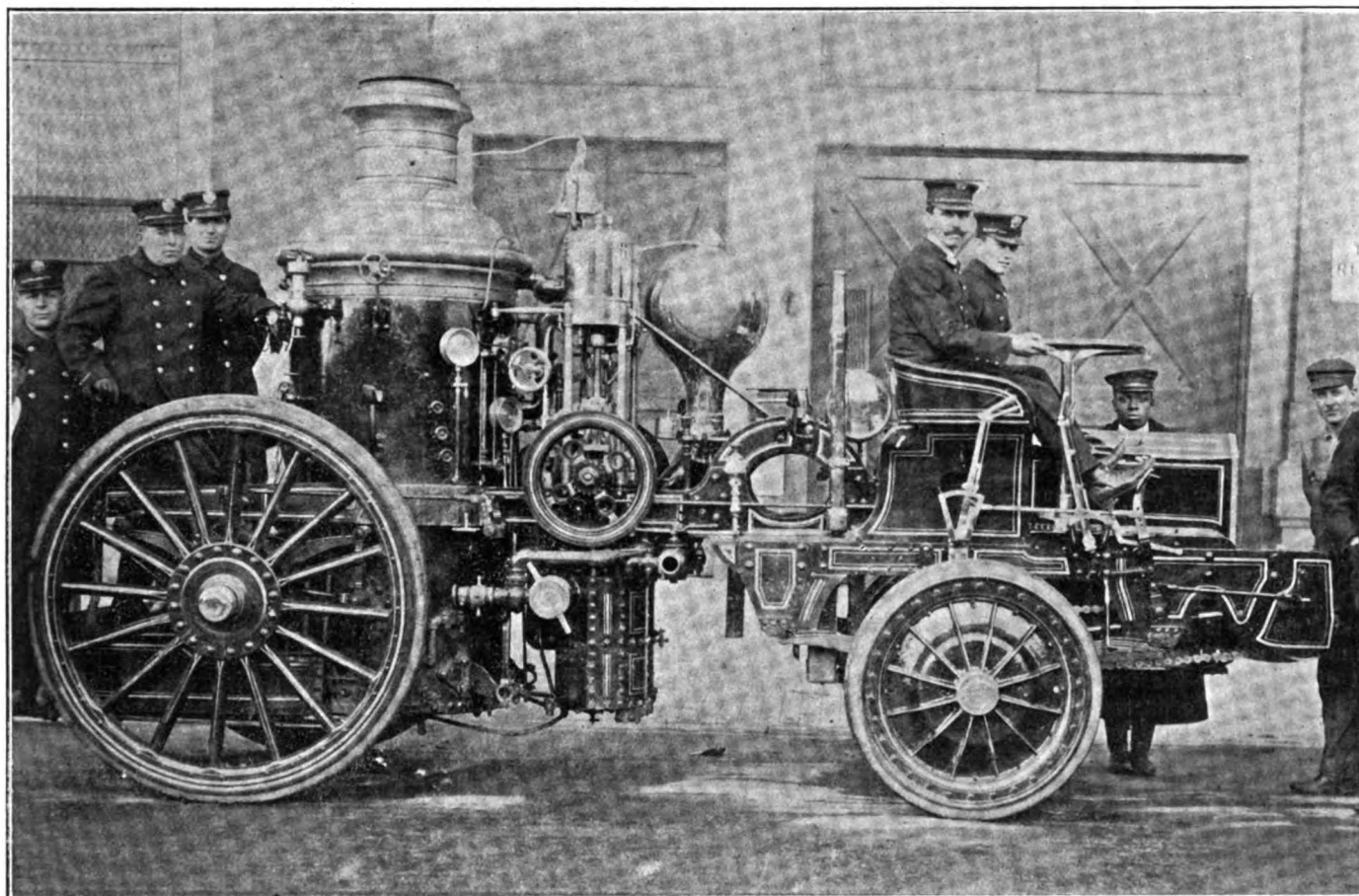
turned on, which may be done while the motor is running under load, and no further attention is required while the motor is running. If the engine is stopped and allowed to stand for any considerable length of time the producer cools off and when starting again recourse must be had to gasolene, but if the stop is a short one the start can be made on kerosene, the motor getting under way quite as readily as with gasolene.

In order that the proper time for changing over from gasolene to kerosene may be definitely known, the apparatus is fitted with a special thermometer which indicates the temperature of the gases just as they leave the producer. When the temperature reached 186 degrees Centigrade the kerosene is turned on. If the producer is installed in a car the thermometer may be placed on the dashboard where the driver can see it, though it does not make any particular difference when the change is made if sufficient time is given for the proper heating of the coils.

The mixture formed by the producer is a very rich one, and the additional air required is introduced by means of the auxiliary air intake of the regular carburetter

HOW NEW YORK IS MOTORIZING ITS FIRE DEPARTMENT

Methods Adopted to Modernize Horse-Drawn Apparatus and Avoid "Scrapping" of Serviceable and Valuable Property—Some of the Perplexing Problems Involved—More Motor-Propelled Apparatus Just Placed in Service, Including First "Adapted" Front-Drive Pumping Engine.



NEW YORK "STEAMER" ADAPTED TO FRONT-WHEEL MOTOR DRIVE—THE FIRST OF ITS KIND

Difficult though it may be for the head of a vast fire department like that of New York City to select the best available motor fire apparatus for the replacement of the time-honored horse-drawn equipment, there really is much more to be considered in the motorization of the fire-fighting organization. Horses must be properly disposed of as they are replaced by motors, and the drivers schooled in the management of the new apparatus. But there is a problem that is even harder to solve. While it is not such a very serious matter to "scrap," sell, or retire to rural districts or smaller towns a considerable number of chief's buggies, hose wagons, and such light and comparatively inexpensive apparatus, it is altogether different when it comes to getting rid of the millions of dollars worth of steamers, ladders and water towers.

In the case of New York the water towers are being taken care of by being coupled up to gas-electric tractors, one of

which is in service, a second in process of installation and others under consideration; ladder equipment can be mounted on motor chassis, when it is not desired to replace it with more modern aerial apparatus; but the fire engines, of which there are 200 in New York, costing on an average, \$6,000 each, cannot be carelessly swept into the discard, and are not easily salable, except in occasional instances, for New York is by no means the only spot on the map where fire fighting apparatus is being motorized. So there is the problem of how to motorize the fire engine fleet and yet keep the present engines in service until they are worn out or otherwise unfitted for further work. The idea of Commissioner Johnson, head of the New York fire department, is to convert the steamers into motor-propelled machines, retaining the steam pumping mechanism unchanged and using motors only for propulsion. In the meantime gasoline apparatus, in which the same motor

serves both to propel the vehicle and to drive the pumps, can be tried out and a fund of information accumulated at leisure.

With this plan in view, considerable work already has been done looking toward the use of the present steamers plus propelling motors. The first experiment tried consisted in coupling up an engine to a Couple-Gear tractor, and the experiment was a decided success, though it was of short duration, being carried out with the aid of a tractor borrowed from a coal dealer. A steamer was converted later by extending the frame forward and mounting on it a gasoline motor of 110-horsepower driving through a complex system of gears and chains to the rear wheels, to which sprockets were bolted. While this machine was capable of great speed—far more than it was possible to utilize under any working conditions—it apparently was not sufficiently substantial for the power installed. The upshot of the difficulty of propelling steamers by driving the rear

wheels has led to the very serious consideration of front wheel drive systems for this work, and two steamers were set aside for experimental purposes, one being turned over to Walter Christie's new Front Drive Motor Co., and the other to the Couple-Gear Co., the latter to be a decided innovation, so far as this country is concerned, in that it is to be driven by electric motors drawing their current from storage batteries. The Christie machine, which just has been put in service, is of the straight gasoline type, and, as the accompanying illustration shows, the conversion was worked out in a manner that left little to be desired, from the point of view of appearance, while, as far as preliminary tests show, the actual operation of the outfit is very satisfactory indeed.

In making the Christie conversion the first step was to lengthen the frame forward to provide the necessary room for the motor and its accessories. The motor, of the T-head type, was installed a little back of the front end of the frame, leaving room at the 'front' for the gearbox and clutch, which thus occupy a very unusual position. The gearset is of the sliding type, giving three speeds forward and the usual single reverse. From the right hand side of the gearbox a shaft projects, which corresponds to the "tail-shaft" or final drive shaft of the more conventionally placed gear. On this shaft is mounted a sprocket from which power is transmitted backward by means of a very heavy chain to a countershaft directly over the front axle. The construction of this countershaft and the manner in which it operates are peculiar. As it corresponds to the jackshaft of a chain-driven car of the conventional design, it carries the necessary differential gear. Directly over the steering pivots of the wheels, and exactly in line with their axes, are two universal joints. Beyond the universal joints the shafts are continued in the form of short extensions upon which are mounted small spur pinions which mesh with internal gears secured to the wheels. By this arrangement the driving power is transmitted to the front wheels whether they are pointing straight ahead or turned, as in rounding a corner, the universal joints swiveling in the same line as the steering pivots. The wheel gearing is entirely covered and protected by a metal casing, so that the admission of dirt is prevented and the lubrication of the gears is a simple matter. The wheels are of the disk type, the outer disk being ribbed radially, giving the appearance of spokes and at the same time adding to the stiffness of the wheel.

The manner in which the cooling system is worked out is almost as unusual as the drive. The front of the motor hood looks, at first glance, to be a radiator of the horizontal tube type; in reality, however, it is not a radiator at all, but a perforated brass sheet and nothing more. The radiator, which is very much larger than

the front end of the hood, is hung just back of the front wheels, with its lower edge about on a level with the axle. Being considerably lower than the motor, there would be difficulty in causing the water to circulate in case it ran low unless special means were provided for keeping the water level above the pump, which is not of the lifting type. For this purpose an auxiliary water tank is installed at a point where it is higher than any other part of the cooling system. This tank, which is cylindrical in shape, can be seen in the illustration just back of the driver's seat. Not only does it keep the pump always well primed, but it also provides an auxiliary supply and assists considerably in the cooling process, being connected in the system in series—that is, all the water passes through the tank each time it goes the rounds. To add a little more to the unusualness of the outfit, the fan is placed just in front of the radiator instead of being behind it, as is usual, and is driven by a small countershaft and belts.

The driver's seat on this very unusual machine is placed at the right side of the motor hood, the placing of the radiator in the rear making a small hood possible, leaving plenty of room for a small foot-board; there is room only for the driver on the seat, though a second man may stand on the opposite side of the motor. The steering wheel, carried on a vertical column, is of very large diameter and the inside of the rim is notched to give the fingers a secure grip. The machine steers very easily, even when under full power.

The motor is "cranked" by means of a Disco starter, which has performed its functions satisfactorily during the trial period. This is a matter of some importance, as the motor is rated at 80-horsepower, and an engine of this size is not as easy or as quick to start as a runabout engine. The department has experienced considerable trouble from delays in getting big engines started when in service, and a reliable starting apparatus is considered most desirable.

Having been run between 300 and 400 miles in preliminary work, at all speeds up to the maximum of 35 miles an hour and up some very severe grades, the engine was put into actual service on Monday last, February 19th, at Engine 73 on 115th street, Manhattan—a district where a large number of alarms are turned in. Half an hour after taking its place in the house the machine went out on an alarm, and the end of the day saw no less than four "runs" to its credit, the mechanism working smoothly in each case. The lively character of that section of the city, from a fireman's point of view, will thoroughly try out the machine; 80 to 100 calls a month are not at all unusual for Engine 73.

Another Rust Preventative Appears.

An English concern, the Richards Anti-Rust Syndicate, of Coventry, is exploiting

a rust-preventing process for application to iron and steel surfaces which is said to resist the action of water and even of acid. The metal is given a coating by boiling it in a liquid preparation for a couple of hours—more or less, according to the thickness of the coating desired—and is then treated with oil, which turns the surface black.

Dundee's New Powerful Fire Engine.

The Fire Department of the City of Dundee, which is in Scotland, recently has been made more complete by the addition of a new motor fire engine which is unusual in that it is capable of lifting water by suction to a height of some 28 feet, the exact height being governed by the state of the barometer, of course. The vacuum necessary to attain this abnormal lift is obtained from a double-opposed twin-cylinder air pump which is completely enclosed and runs in an oil bath. It is driven from the water pump propeller shaft and immediately the water reaches it is disconnected by means of a conveniently placed lever and remains idle while the water pump is at work. The whole apparatus, which was manufactured by Argylls, Ltd., of Alexandria, is rated at 75-horsepower and is capable of delivering 450 gallons of water a minute at a pressure of 140 pounds to the square inch. At slightly higher speed, the power of the engine increasing to approximately 85-horsepower, the discharge is 600 gallons a minute at a slightly lower pressure. The motor is started by means of compressed air and the water pumping apparatus at the rear is so arranged that the engine can work in conjunction with the street mains or can draw its supply from convenient rivers or ponds. Another of the interesting points of the machine is that the pump valves on the delivery side are of the internal hinge type and are entirely automatic.

Illuminating Taxicab Flags at Night.

The "Vertriebs-Gesellschaft Magnet-Elektrischer Apparate" of Berlin, has placed on the market an ingenious device for luminously giving notice at night whether the flag of a taxicab is up or down. It consists of a small iron tube, connected up to one pole of an electric battery, and containing some free quicksilver. At the top is an insulated iron pin forming the terminal of a wire passing through a signal-lamp to the other pole. This arrangement is attached to the flag-apparatus in such a way that when the flag is up, the quicksilver completes the circuit, and, hence, brings about the lighting of the lamp. When the cabman pushes the flag down, the quicksilver flows away from the tube, and, the circuit being broken, the light goes out. Of course, the tube can be so attached as to give a light when the cabman has a fare; and can also be equipped for producing lights of two colors—green, say, for "engaged" and red for "disengaged."

DEVELOPMENT OF THE CONTROL LEVER MECHANISM

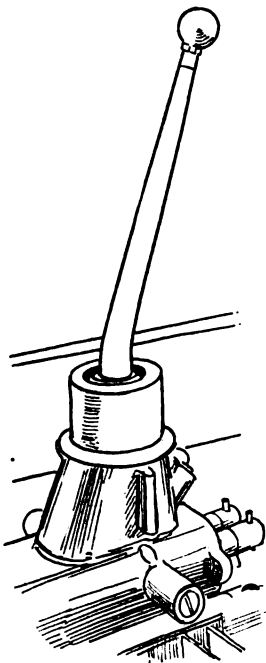
Remarkable Variety and Individuality Disclosed by Close Inspection—The Tendency Toward Housing the Lower Ends of Gear Shift and Emergency Brake Levers and the Advantages of This Method of Construction as Compared with the More General Open Type.

Of course foreign cars are not nearly so complicated as they were several years ago, nor are they the moving museums of mechanical oilers, gradometers, pressure gauges, indicators, etc., ad. lib., that they were, though admittedly they still are far behind their so-called "Yankee cousins," in the elimination of such things. Simplification really started in America, the realm of the low-priced car, and it was not until recently that foreign designers began to realize the advantage of what Howard E. Coffin has been pleased to style "clean de-

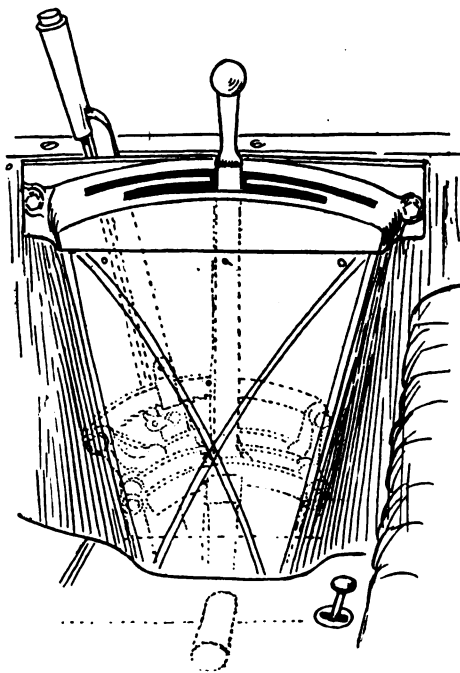
a great many cases the bottoms of the levers and their bearings are completely enclosed in housings which serve also as the lever quadrant and the support for the levers.

One British engineer styles it a "sweep-

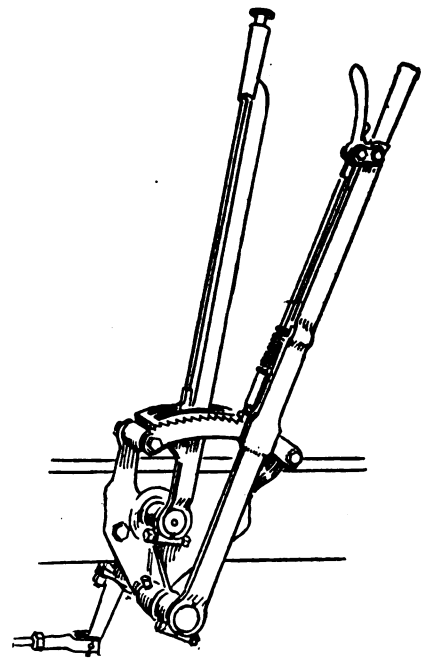
fact which has not been overlooked by quite a few manufacturers. On the other hand, however, merely for the purpose of preventing the ingress of dust and dirt, there really is little necessity for the housing when the lever mechanism is in a comparatively protected position in the center of the footboard. Of course when the levers are outside the frame and the body there is logic in protecting the mechanism with some sort of covering for in truth there are few, if any, other moving parts of a car which are less protected and



REO BALL AND SOCKET HOUSING



BUICK ENCLOSED LEVERS



CORBIN ARRANGEMENT

sign." This year there is evident more than ever a tendency in foreign design toward refinement of detail and the elimination of many of the parts which hitherto have been considered absolutely essential. Greater care for the protection of passengers also is evident, as witness the often unsightly high-sided bodies which are used, and for the protection of such parts of the car's mechanism as ordinarily are left out in the open and at the mercy of the elements. In this connection, it is interesting to note the lengths to which some foreign manufacturers have gone to enclose the mechanism operated by the gear shift and emergency brake levers, which feature is quite noticeable for the reason that in the majority of cases the levers are placed outside the bodies. In

ing change which has occurred during the past season," and ascribes as the reason the "flush-sided body" though the contention is, perhaps, not quite as clear as it might be. The most natural question in the world is, if the levers and their mechanism are enclosed in the front compartment why should further housing be necessary? Or if they are not put inside the doors why should the flush-sided body make housings any more necessary than the ordinary type of open body? But be that as it may, the fact remains that there is a very marked tendency among foreign designers toward enclosing the bottoms of control levers, and it is good. That is to say, it is good for one reason at least, and possibly two: It protects the mechanism from dust and dirt and strengthens it.

Perhaps, in view of the growing popularity of center control, it is surprising that there is not a greater tendency in this direction in American cars. As is perfectly obvious, the location of the levers in the center of the footboard permits of such a housing being used most easily, a

therefore more susceptible to depreciation under the action of road dirt and grit.

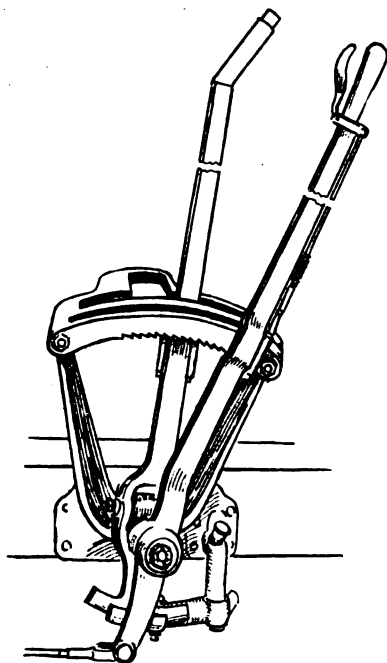
But even though housings are advisable it is well to remember that a type indiscriminately chosen may actually cause greater damage than if none is used. For instance, any kind of housing is likely to act as a catch-all for the dust and dirt which every car stirs up from the road; when the mechanism is left open it cannot collect more than a certain amount of dirt governed by the amount of exposed surface, but when a housing is used the amount collected is governed only by the amount of unoccupied space which is enclosed. That is, of course, provided there is no opening at the bottom to allow accumulations to drop out onto the road. Another obvious reason for such an open-

ing is that otherwise water may collect in the housing and remain there, unsuspected, for long periods. But a hole is a hole, no matter what its location may be and as there are few holes through which dust (and grit) cannot work there seems to be but one way out of the difficulty. It is to make the housing as tight as possible by closing the quadrant slots by means of sliding plates, but even this method presents difficulties of accomplishment, and at the least scarcely makes for simplicity.

Not the least of the difficulties which a tight housing presents is that of providing some means of lubricating the mechanism. If the housing could be made perfectly tight it would be a simple matter to pack it with grease and forget it for a season,

selves is the reason for the rattle in the majority of cases; they commence to vibrate and touch the sides of the quadrant slots. Though the trouble has been eliminated largely by some manufacturers by

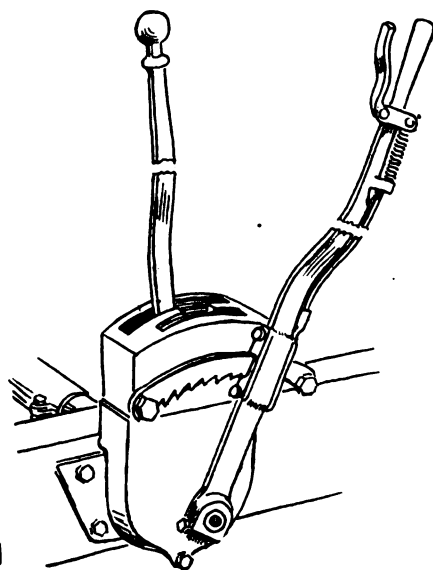
mechanism is protected in a more than ordinarily complete manner and rattling is eliminated for the reason that they are stayed at the top in slots which are too small to permit of vibration. Incidentally they are absolutely out of the way of the driver and at the same time are easily within reach of his hand. As may be seen in the accompanying sketch which shows the construction in detail, the levers are enclosed in a housing which is attached to the inside of the door and is leather covered to match the rest of the upholstery. The striker rod actuating mechanism is practically the same as has been used in previous Buick cars in which the levers were not enclosed, and is located inside the chassis frame and below the



PACKARD PROGRESSIVE CHANGE

but as it is not possible to prevent a certain amount of dirt working in, some other means must be provided. A small grease cup might do, but public favor steadily is turning against such contrivances, and a better way would be to provide a small oil pipe with a tight cover. Adjustability, too, might suffer if a housing were used, but this factor can be disregarded in view of the fact that adjustment seldom is made in the particular parts which would be enclosed.

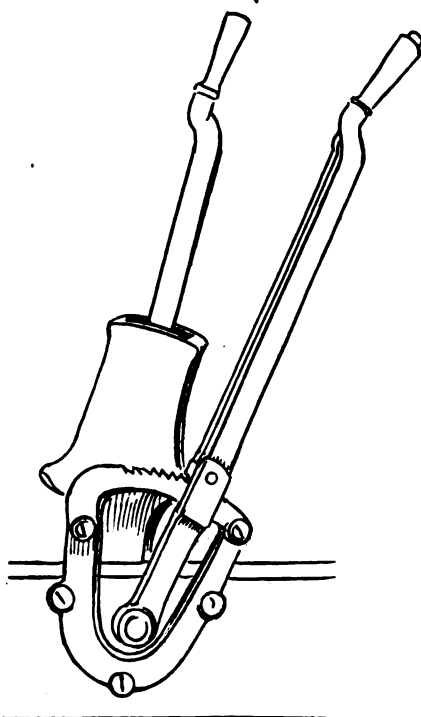
Not the least of the advantages of a properly designed housing is that if it does not effectively remove the cause of rattles, at least it deadens such sounds. It is doubtful if there is a single pair of levers on any car which do not rattle more or less, if not at one car speed then at another, and if for no reason than that in the future the silence of a car in operation probably will be one of its greatest selling points, other things being equal, it might pay designers to devote more time and energy to the reduction of such rattles. The comparatively great length of the levers them-



STODDARD-DAYTON HOUSING

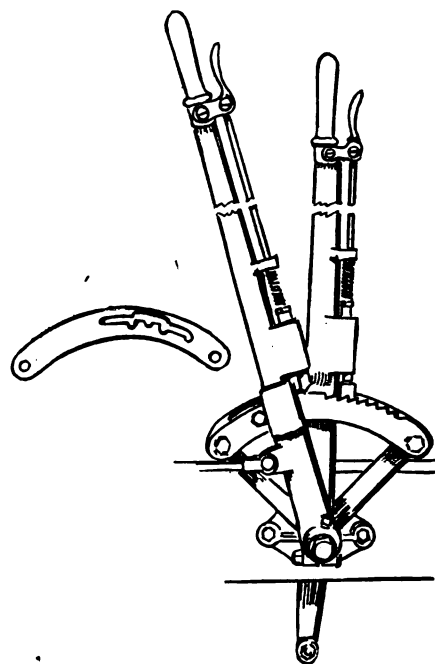
the simple expedient of shortening the levers, or stiffening them considerably, the manufacturer of Buick cars is the only one who has attempted a solution of the problem by staying the levers at the top.

As a matter of fact, the location of the



THOMAS LEVER HOUSING

Buick levers kills three or four birds with one stone, so to speak. The levers are neither inside nor outside the door; which effectively eliminates the almost eternal question as to which is the better location; they are completely enclosed and their



STEVENS-DURYEA QUADRANT

footboard, where it is in a protected position.

Stoddard-Dayton cars are among the very few in which the control levers are mounted outside the chassis frame with the mechanism completely enclosed. The housing is bolted to the frame and serves also as a support for the emergency brake ratchet which is bolted to the outside of the case. The quadrant is of the usual H type, providing for three speeds forward and reverse, and the emergency brake cross rod is inside a tube which serves to actuate the gear striker rods.

Though the control mechanism of a great many cars is similarly arranged, the emergency brake rod inside the gear shifting rod, or vice versa, not all manufacturers incline to this construction, and there are several points which are not in its favor though on the whole the advantages of the method outweigh the disadvantages. In the first place, cases have been known where it was impossible to move the gear shift lever when the emergency brake was set, owing to the fact that a certain amount

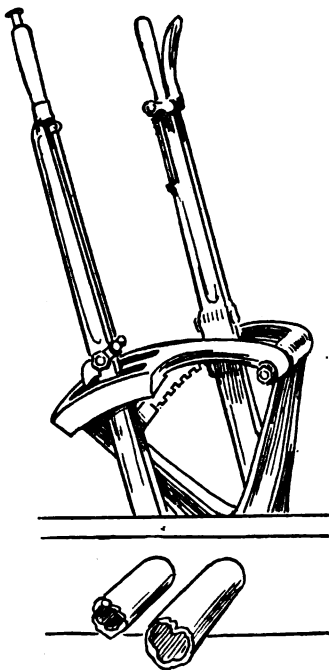
of binding took place. Of course, it may be argued that it seldom is necessary to shift gears when the brake is set, but if the car is stopped on a hill, for instance, the circumstances are altered and there often is no alternative other than to chock the wheels of the car. Another objection is that it often is difficult to lubricate the sliding surface properly, and when they are lubricated to keep out dust and dirt, which, mixed with the oil or grease into a sticky paste, forms a most effective abrasive agent and at the same time tends to cause the rods to jam, and in turn to cause damage to the change gears by not permitting quick shifts. Generally, however, the clearance between the two rods, or rather between

the lever and to provide a neat opening in the footboard.

Several other manufacturers as well have adopted quite similar control mechanisms in which the gear lever quadrant is eliminated and the shifting arrangement is contained directly in the gear case. Prominent

there is nothing to rattle, no quadrant and no rods or shafts, and the absolute rigidity of the whole and the impossibility of altered relationship through frame distortion is ensured.

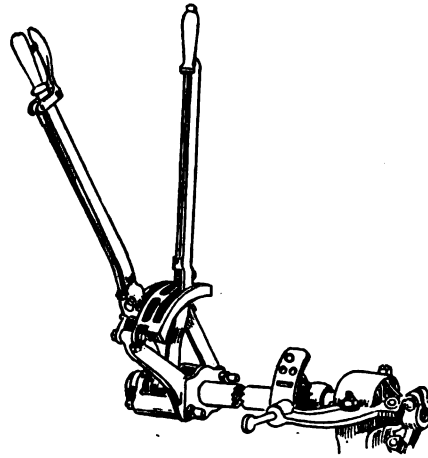
The Lozier car is another in which the preference of the manufacturers for separate gear shift and emergency brake shafts is evidenced. Owing to the fact that the brake shaft is carried behind the other, the arrangement being unusual and distinctive of this particular car, a somewhat different combination quadrant is necessary in order to allow for the different circles in which the levers swing. The bracket, which is securely bolted to the outside of the chassis frame, serves as the brake



LOZIER SEPARATE SHAFTS

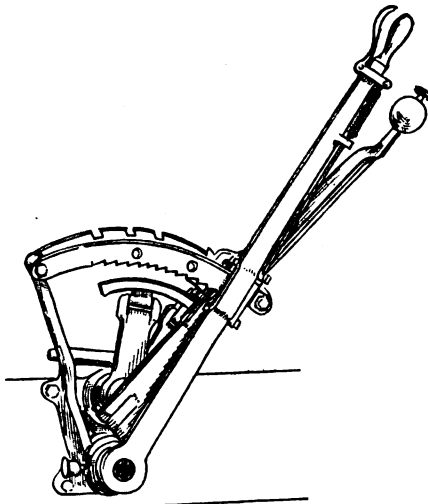
the rod and the tube, is such that little or no lubrication is necessary and trouble from this source is the exception rather than the rule. By no means the least of the advantages of the system is that it permits the use of the smallest possible number of parts by eliminating the necessity for two sets of bearings and bearing supports.

In the Thomas arrangement the shafts are separate and there is no gear lever quadrant. The emergency brake ratchet quadrant is bolted to the outside of the frame in the orthodox manner, and over the lower end of the gear shift lever, which is inside the front door, there is a small rectangular housing which is bolted to the inside of the frame, and extends upward through the floorboard. The whole gear shifting mechanism, other than the hand lever, is located directly in the gear case. The gears are selectively operated, the shifting lever operating through a ball and socket joint which is mounted on an extension of the gear case cover. The purpose of the housing, therefore, is merely to prevent the driver coming in contact with



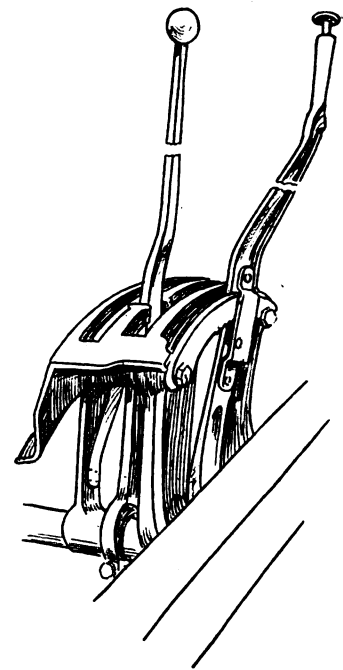
PIERCE-ARROW INTERLOCK

among them is the Reo Motor Car Co., and the latest model Reos are still further distinguished by reason of the fact that the emergency brake quadrant also is eliminated. That is to say, it is eliminated from its time-honored place at the side of the chassis frame. The emergency brake is actuated by means of a pedal, instead of a side lever, which makes unnecessary the usual form of quadrant which is replaced by a ratchet stop on the pedal. The ar-



WHITE SELECTIVE QUADRANT

angement of the gear shift lever, shown herewith, makes plain the possibilities of center control in the elimination of many of the parts which in the past have been considered impossible of elimination. The lever rises directly from the gear case, through a perfectly tight housing, which is a unit with the cover, and the whole selector apparatus is enclosed in the gear case and therefore is completely protected. Rattles are impossible for the reason that



E-M-F INSIDE QUADRANT

ratchet quadrant, and inside of this is bolted the gear shift lever quadrant which is of the usual modified H pattern to allow of four speeds forward and reverse. All such apparatus, in which a quadrant is used, differ from the type in which a ball and socket joint is employed in that there is a visible means of making the gear selection; with the ball and socket joint, and no quadrant, the operator must rely on his memory, of course, though there is little to cause worry in this respect.

The two shafts which serve to actuate the emergency brake and the gear change mechanism in the Corbin car also are separate, though the arrangement differs from the other, in that they are arranged one over the other. The quadrant therefore is quite symmetrical in appearance and is bolted to a bracket which in turn is bolted to the outside of the chassis frame. The single hole through the frame is necessary, the emergency brake rod being low enough to come below the side member.

The fact that in carrying out some arrangement is such, however, that but a

single hole through the frame is the side member. The mere fact that in some arrangements separate holes for both shafts are necessary militates, in the opinion of not a few manufacturers, against the system, the contention being that the frame thereby is unnecessarily weakened. Whether this is so or not is open to question; at least there have been no recorded cases of fractured or sagged frames due to this cause alone. The Corbin quadrant is of the regulation H type providing three speeds forward and reverse.

The arrangement of the White quadrant is peculiar in that selective operation is provided without the usual gate change. Both the gear lever quadrant and the emergency brake ratchet are mounted on the same bracket which is bolted to the outside of the chassis frame, the two actuating rods being separate and arranged one over the other. The gear shift lever moves in a plain bearing at the bottom and is not connected with the gear shifting device until the gears actually are in use or are about to be used. That is to say, it is hinged at the bottom and when in the neutral position may be moved inward, to connect with one arm which operates two striker arms in the gear case, or outward, to connect with another arm which operates the other striker arms. Thus, though there is not the usual H-type quadrant, the movement of the gear shift lever is the same as it would be if there was one. The object of the arrangement is to provide a more than ordinarily secure lock to prevent the gears coming out of mesh in use, and also to obviate the possibility of more than one set of gears being engaged at the same time. The movement of the gear shift lever backward and forward is regulated by notches in the quadrant which ensure the proper engagement of the gears.

The new E-M-F control mechanism arrangement is not unlike the White in one respect, though it is totally unlike it in all others. Thus, the hand lever is mounted in a bearing at the bottom and also is hinged so that it may be moved outward and inward. When it is moved outward, the lever is connected with another lever which in turn actuates one of the striker arms; moving it inward connects it with the other striker arm. Therefore it is not actually connected with the gear shifting mechanism until the gears are in use or are about to be shifted; otherwise the arrangement is quite different. As is customary, the bracket supports both the gear lever quadrant and the emergency brake ratchet, the latter being bolted to the former. The whole is bolted to the inside of the chassis frame and also is supported at its inside end on a tube which encloses both the gear shift lever and the emergency brake lever which are arranged one inside the other. Naturally, the arrangement obviates the necessity for a hole through the chassis frame for the rods because they are carried in a bearing in the bracket itself.

The only holes which are required are necessary in any case, unless center control is employed, and serve for the bolts which hold the bracket in place.

Perhaps the most distinctive part of the Pierce-Arrow control mechanism is the unique clutch interlocking device by means of which it is rendered impossible to move the gear shifting lever save when the clutch is disengaged. It consists simply of a curved plate attached to the gear shifter shaft, in which there are four small round holes, and a long narrow slot, the slot permitting the clutch to be engaged when the gear shift lever is in the neutral position and the holes allowing its engagement only when the selected pair of gears are meshed properly. The quadrant itself and its method of support are standard and are in accordance with what has been proven to be the highest class of engineering practice. The bracket is a casting which is bolted to the outside of the chassis frame and to which are bolted the emergency brake ratchet and the gear lever quadrant. One of the noteworthy features of the arrangement is that the bell crank which actuates the emergency brakes is located at the end of the cross shaft and between the housing which serves to enclose the gear striking rams and the gear case. It is thus well supported and there is no likelihood of strain bending the cross shaft. The shaft which actuates the striker arms is tubular and encloses the emergency brake shaft which is solid.

Though by far the greatest percentage of manufacturers employ selectively operated change gear mechanisms there are two, at least, who for a long term of years consistently have advocated the progressive type and whose products have acquired a reputation for merit that cannot be gainsaid; they are the Packard Motor Car Co., and the old firm of Stevens-Duryea. Incidentally in both brands of cars are employed individual and distinctive control mechanisms which give evidence of careful thought in design.

Of the two, the Packard is perhaps the most unusual for the progressive principle has been varied slightly in that the reverse gear is obtained by moving the gear shift lever, not backward or forward, but sideways into a slot in the quadrant. The lever itself is pivotally mounted on the tubular shaft which actuates the striker arms. At its lower extremity there is a small quadrant which fits into a shoe mounted on a bell crank by means of which the reverse gear striker arm is actuated. When any of the forward speed gears are engaged, this small quadrant simply slides in its shoe without moving the bell crank. When the lever is placed opposite the right-angle slot in the lever quadrant, however, and is moved inward the small bell crank is moved and in turn moves the reverse gear striker arm. The quadrant bracket is bolted to the outside of the chassis frame, and the arrangement of the

component parts is such that they are readily accessible for inspection or adjustment.

As may be seen in the accompanying illustrations, the Stevens-Duryea arrangement is quite different from the Packard arrangement, though the same progressive principle is used in both. Its most unique point is the quadrant which the manufacturers not ineptly have styled "self-finding." The gear shift lever is provided with a latch, but as may be inferred from the sketch it is not always used. With the lever in the neutral position, which is in the center of the quadrant, first speed is obtained by compressing the latch and moving the lever, with the latch compressed, as far as it will go to the rear. For second speed, the lever is simply pushed forward as far as it will go with the latch compressed. Third speed is obtained by moving the lever forward without touching the latch. To change down, the operations are reversed, of course, and to obtain reverse from neutral it is merely necessary to push the handle to the rear as far as it will go, without touching the latch. As is the case with so many other cars, the quadrant bracket is bolted directly to the outside of the chassis frame. The emergency brake cross shaft, on which the gear shift lever is mounted, is very short and serves merely to support the levers. From the emergency brake lever, a rod connects with a cross shaft considerably further back on the chassis from which in turn the brakes are operated by means of other rods.

Taken all in all, the method of constructing gear shift levers and the methods of mounting them have suffered but little change during the last few years despite the very evident changes which have been made in other parts, and it scarcely is likely that they will show a very great amount of change for some years to come. Such things have become pretty well standardized for one reason, and for another there really is little cause for altering mechanisms which have proven satisfactory in the past and still are giving satisfaction. That is to say, they are satisfactory to the majority of manufacturers and motorists. There are a certain few, of course, who believe that something still better one day will be evolved and it is not unlikely that it will. But until it is, and no man can say when the change will occur, present day methods suffice. What the future will disclose can only be conjectured, though there appears to be tendency toward the automatic shifting of gears after the manner which has met with such success in several makes of commercial cars.

Grease That Interferes With Gear Shifts.

It does not pay to use grease that is too heavy in the gearbox. In addition to causing undue friction and possibly heating, it interferes with the easy shifting of the gears.

FOR PREVENTION OF MUD-SPLASHING

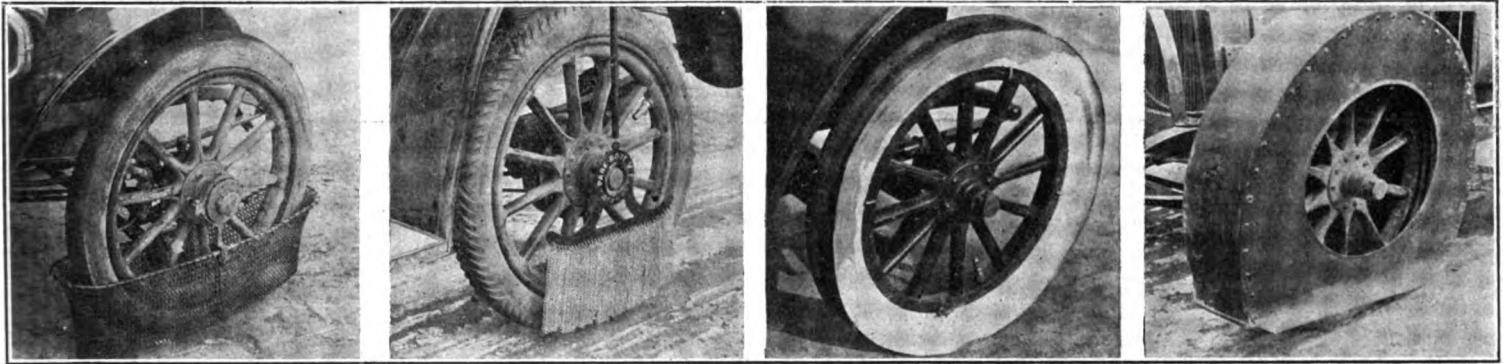
French Tests of Devices Designed to Save Pedestrians' Clothing — Awards Made for Utility and "Beauty."

Spurred by an impending law and following the example of the Belgium Automobile Club, which last summer held a series of

thousand persons. As prizes for the winning devices gold, silver and bronze plaques and medals had been offered by the automobile clubs of France and of Seine-et-Oise, by the city authorities of Paris and Versailles, by several of the French newspapers and by a number of sporting clubs and associations, constituting ten prizes in all.

The trials were divided into two parts,

drive through inch deep artificial slush at 20 miles an hour, the slush being laid on a lane formed by white screens, placed 11 feet distant from each other, so that the axle ends of the cars would pass within three feet of either of the screens. According to the quantity of mud splashed upon the white boards each car was charged with a number of points arbitrarily selected to represent certain quantities; the least num-

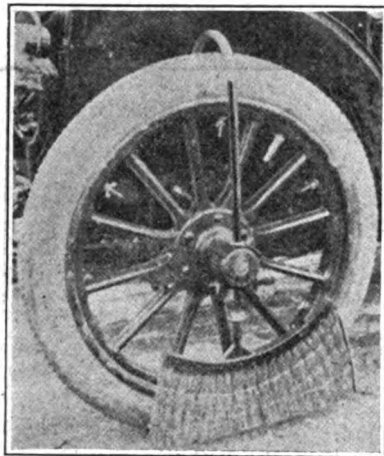


NEAR-WINNERS: PEYROT

BERGER

MILLARD

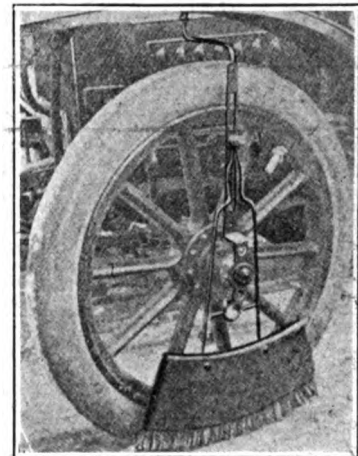
GERBER



FIRST AWARD—DREUX



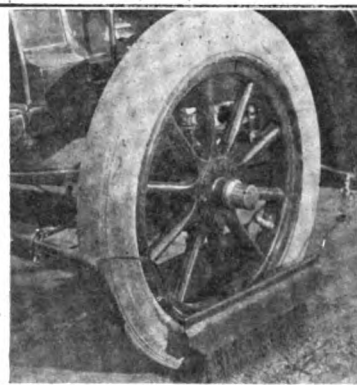
THIRD AWARD—NERON-BRISTOL



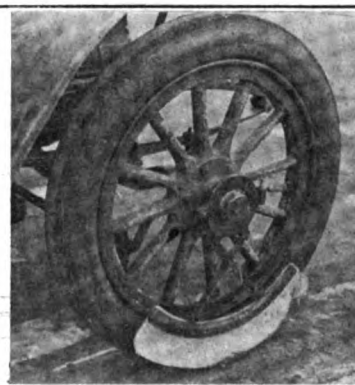
SECOND AWARD—GRUYELLE



"ALSO RANS": PINCON



PINALY



VAN DUREIN



MORAND

so-called "mudguard trials" in one of the city streets of Ghent, the Automobile Club de Seine-et-Oise (which comprises the district in which Paris is located) inaugurated a series of somewhat similar tests in the neighborhood of Versailles, on February 5th, which attracted a crowd of several

and the competing devices—some of which were fearful and wonderful creations—were judged according to two criterions: one of utility and one of "esthetic outline"—as the French would have it. Over 30 competitors lined up for the first part of the trials at the Place d'Armes, each being compelled to

ber of penalization points, of course, winning the first prize, a beautiful art plaque presented by the City of Paris. After the passing of each car, the white boards were cleaned and whitewashed.

According to the scoring of the officials in charge of the contest the best showing

was made by a device invented by Dreux, the other awards being made as follows: (2) System Gruyelle; (3) System Neron-Bristol; (4) Peyrot; (5) Berger; (6) Milard; (7) Gruyelle; (8) Garchet-Itasse; (9) Menu; (10) Gerber. A few cars had systems made by the same manufacturer, but differing slightly in arrangement of mud-catching shields.

After the "utility" trials were over, the cars were required to pass through the streets and along the parkways, past various groups of judges scattered at irregular intervals and at "secret controls" throughout the town. There was no definite route laid out for any of the cars; they were at liberty to proceed in whichever important street they preferred, but were compelled

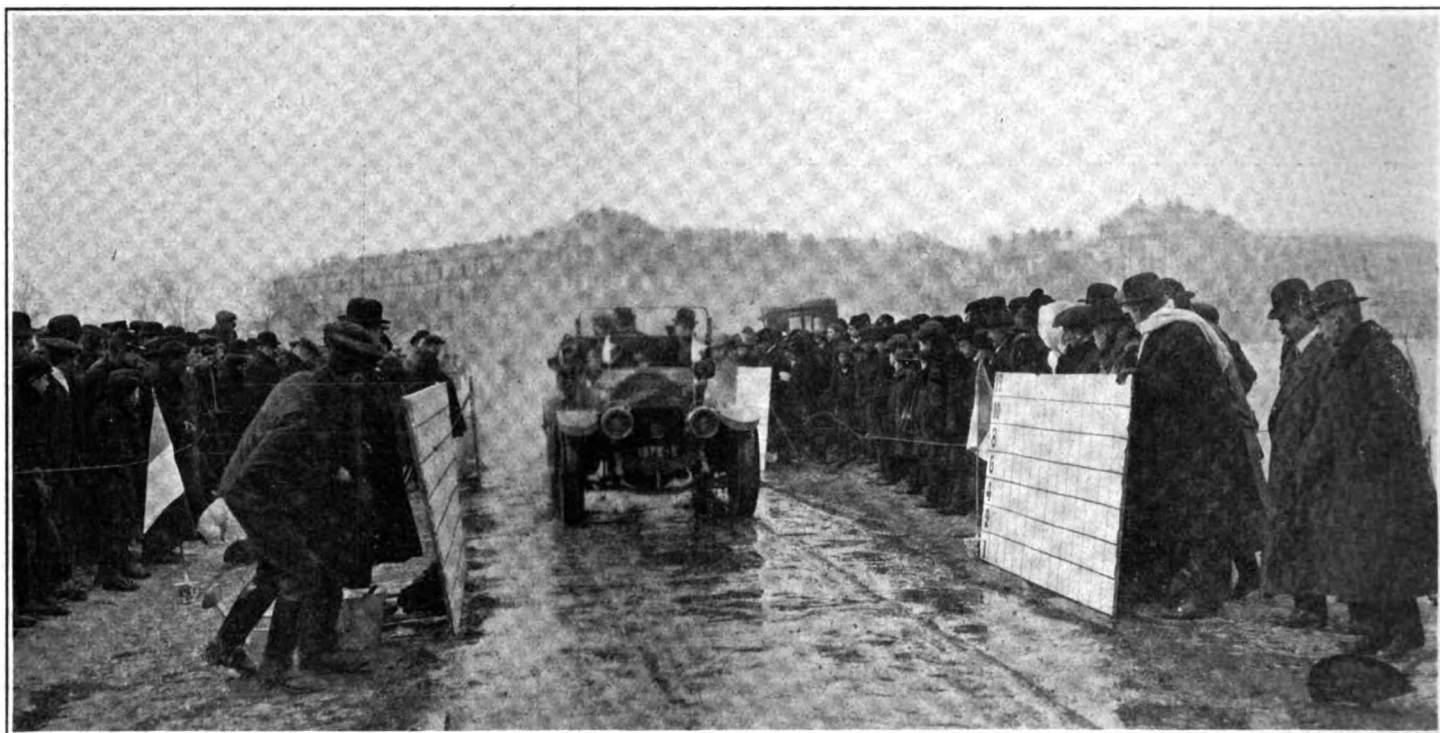
curb stone, which they had to accomplish without damage to the devices.

From a technical point of view, the various devices shown in the accompanying pictures, which represent some of the entrants in the contest, are self-explanatory. They consist of either metal or rubber plates or shields fastened in more or less ingenious manner to the hubs of axles, or the springs of the chassis, or to the mudguards of the car. A few were made of wire mesh, and while these proved very effective and were rated highly in the "utility" test, they failed woefully when it came to judging of "beauty of outline." For instance, in the case of the system Menu, its utility record was practically perfect, only very small spots of mud showing upon the

heavy strains unless their hardness is tempered. A very acute-angled cutting edge made from an unsoftened file will be beautifully sharp, but the edge will break away easily. Care should be exercised in grinding to prevent the sharp points and edges of the tool from burning. A slow speed stone provided with a drip is best for this purpose.

Features of Cox's Crankless Starter.

A new motor starter, of the class which depends for its action upon the explosion of acetylene gas in the cylinders, has been brought out by the Cox Brass Mfg. Co., of Albany, N. Y., an old concern which latterly has been identified with the automobile industry because of its wind-



HOW THE SPLASHGUARD TESTS WERE CONDUCTED AT VERSAILLES, FRANCE

to pass close to the sidewalks and to drive at no faster a pace than eight miles an hour. The scattered groups of judges made notes of each passing car, placing them into different categories as to their more or less pleasing outlines, and later on compared notes and awarded the "beauty" prizes. The idea of scattering the judges and having the cars proceed at leisure and separated as far as possible from each other, was to afford the best comparison of the "equipped" cars with those of ordinary motorists passing through the same streets; to note whether or not unfavorable comment was elicited among pedestrians by the passing of the contesting cars, and whether they were conspicuous or inconspicuous. In short, the general public, without actually being aware of it, was as much a judge in making the awards as the judges themselves. Following these tests the cars were required to be driven so close to the sidewalk that the "mudguards" scraped the

white boards after the passing of the car; but from an esthetic point of view it was voted a rank failure and thus obtained only the ninth prize.

The trials were held with the idea of discovering some effective means of preventing the splashing of mud upon pedestrians' clothes, a bill to that effect having been introduced in the French Chamber of Deputies.

Converting Old Files Into New Tools.

Old files make excellent tools, very often, but unless all the requisite shaping can be done by grinding they must be softened by heating to a cherry red and cooling in lime or in the ashes. When shaped they must be re-tempered. Files properly ground are suitable for scrapers and the like without softening. They are very brittle, however, and snap easily under strain, and so cannot be used for making screwdrivers, cold chisels or other tools subjected to

shields, and other motor car accessories. The most conspicuous feature of the new starter, which is styled the "Crankless," is that it is fitted with a device which mixes the acetylene gas with just the right proportion of air for complete combustion—nine parts of air to one part of acetylene. This is accomplished by means of a valve called the Cox adjustable air and gas valve. The use of a correct mixture leaves the cylinders, piston heads and spark plugs clean, gives maximum power from the explosions and does the work with the smallest quantity of acetylene gas. The readiness with which a correct mixture ignites ensures quick starting, and the small amount of gas burned makes for economy. The "Crankless" starter is put into action by pressing a foot button conveniently placed on the floorboard of the car. It lists at \$20, which price includes expressage to any part of the United States.

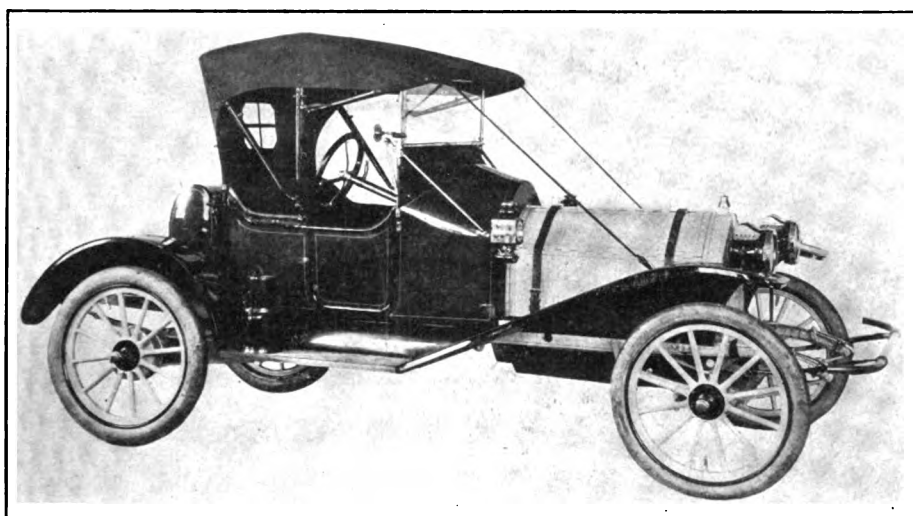
BELMOBILE MAKES ITS APPEARANCE

New Low-Priced Runabout Manufactured in Detroit—Its Distinctive Features and Complete Equipment.

That the market for the small car of very moderate price is a large one is clearly indicated by the rapidly increasing number of machines of this type available which has been increased by the recent launching of the Belmobile, a 20-horse-power runabout with closed body which is listed at \$750, which price includes the car with full equipment. The design is the outcome of the joint efforts of W. D. Bell

the usual integral heads and water jackets, and have a bore of $3\frac{1}{4}$ inches, the piston stroke being $3\frac{3}{8}$ inches. The crankshaft runs in three bearings, the rearmost being 4 inches long. Ignition is by Bosch high-tension magneto, lubrication by the popular self-contained system, with large oil well under the crankcase, and the cooling water is circulated by the thermo-siphon system.

Final drive is through propeller shaft, which is carried through a steel tube which serves as a torque-rod. Full elliptic springs in the rear and semi-elliptic in front provide a suspension that, in combination with the long wheelbase, gives easy riding. Both service and emergency brakes are contained in drums on the rear wheels and are of the expanding type.



BELMOBILE ROADSTER WHICH LISTS AT \$750 FULLY EQUIPPED

and H. R. Fordyce, both of whom have had much practical experience in motor car work; Bell spent three years with the Peerless Motor Car Co., and Fordyce, who is acting manager of the company, has been connected with several motor car concerns, and resigned the assistant managership of the Buffalo branch of the E-M-F company to associate himself with Bell in the new venture. The first car has been on the road since late in January.

A distinctive feature of the new car, which is built by the Bell Motor Car Co., Chamber of Commerce, Detroit, Mich., is the uniting of the crankcase and the gearcase, the two forming a single unit. The gearset gives two speeds forward and one reverse, the control being selective, and the clutch, contained in the same cylindrical housing with the gears, is of the disk type, having ten plates. A large hand-hole gives access to gears and clutch for inspection and lubrication. The motor, of the L-head type, has its valves on the left side and its camshaft is made with integral cams which are finished by grinding after hardening. The camshaft is carried in five bearings, which are open to the crankcase so that the splashed oil thoroughly lubricates them. The cylinders are cast in pairs, with

Low center of gravity is secured by hanging the body low and by the use of rather low seats. The steering wheel column is long and has a very rakish slant from under the up-to-date skuttle dash, and mounts a 16-inch wheel. In keeping with the modern character of the whole car, the details have been worked out in the latest fashion the mudguards are wide, and join with the running-boards; the gasoline tank, of oval shape, is mounted just behind the seat; and the neat doors add a final touch of completeness to the whole.

In the matter of equipment the Belmore runabout is well taken care of, as befits a machine that is designed to attract the attention of a public well educated as to what a car should be and have. There is of course, the usual outfit of tools, jack, pump, horn, etc., and in addition there are five lamps, an acetylene generator, glass windshield and top with side curtains.

Restoring Single Cells to Efficiency.

If a single cell of a storage battery is sulphated, or if the gravity of the solution is very much below that of the other cells, it should be cut out and given a slow charge individually until it is brought to the same conditions as the others.

TO ASSIST STARTING IN WINTER

Engine Starters Best Means, But Lacking Them, Other Means Are Available—What Some of Them Are.

Perhaps because it is known pretty generally that motors are harder to start during cold weather than in the summer time for the reason that gasoline vaporizes more easily when it is warm, the question often has been raised as to whether it is advisable to add to the gasoline substances such as ether or picric acid to increase its volatility or its explosive force to assist in starting. Obviously, the answer must be "No"—indeed, it should be a very forcible "No." All such substances are dangerous or undesirable, or both.

Even though it may be possible for some one who has made experiments to state authoritatively exactly what amount of ether or acid may be used with safety with a particular engine it would by no means be a guarantee that the same quantity would have the same effect with any other engine for the simple reason that no two engines, whether they be of the same make or not, are precisely alike. Whereas one engine might run well on "doctored" gasoline, there is grave danger that another might blow its cylinder heads off on the first revolution of the crankshaft. Besides, there are any number of other perfectly safe ways in which a cold motor may be induced to start with the minimum of "cranking."

On the time-honored principle that an ounce of prevention is worth a pound of cure, the best way to insure an easy start is to leave the motor in the best condition to accomplish the result. Which means, briefly, that when it is stopped, or just before it stops, the throttle should be opened wide to leave a charge of mixture in the cylinders. If the motor is to be left idle for only a short time this may be all that is necessary, though if it is to be left over night in a cold garage other measures may be resorted to.

The simplest of these is to run the engine with the spark fully retarded until it is so hot that the water in the radiator nearly boils and then to stop it with a charge of gas in the cylinders. If the radiator and the hood are covered with a robe—it is necessary that the hood be covered as well, for it acts as an oven—the motor will not have cooled off by morning to the degree where starting it will require more than one or two turns.

Unless a motor is chilled almost to the point where the water in the jackets and radiator freezes there really is no reason why it should be difficult to start, provided the carburettor adjustment is correct, and there is nothing wrong with the ignition. Often it is possible to run a motor with-

out detecting that the carburetter adjustment is faulty. Once it is stopped and permitted to cool off, however, no one will envy the person who has the job of starting it. Obviously, the remedy is to make sure the carburetter is adjusted properly.

Often, faulty carburation is augmented by ignition that is not all it should be and one of the greatest troubles is that spark plug points become burned away until the spark which is produced scarcely is intense enough to fire the mixture when it is warm. The remedy here, too, is perfectly obvious and if such details are watched there should be no occasion for the back-breaking struggles in which not a few motorists unwillingly indulge.

When everything else fails, if priming the cylinders with gasoline fails to produce the desired result there is another alternative in enriching the mixture with acetylene. Great care must be taken, however, as the gas is much more easily exploded than gasoline vapor. The simplest method of using it is to run a pipe to the air intake and then to crank the motor with the acetylene turned on a small amount. Under such conditions, the motor should start almost immediately, and if it does not it is practically a certain indication that something is wrong with the ignition.

The surest way to reduce the labor of starting a cold motor, however, is to equip it with almost any one of the starting devices on the market. Of course, if carburation or ignition is faulty it scarcely can be expected that an engine starter will perform its work properly, and it therefore is necessary to see to it that such things are right. In this respect, the acetylene starter has a slight advantage over the other types inasmuch as it assists materially in overcoming starting troubles that are due to faulty carburation. Even if the motor does not start on the spark, the cylinders are effectively primed, at least, and often it requires but a single pull up on the crank to set the motor to work.

Squeaks Caused by Rotating Shafts.

If there is one thing that is a little more aggravating than another to the man who likes a quiet-running car, it is a squeak that is continually "on the job" but cannot be located. Squeaks caused by rotating shafts lacking lubrication have a regularity that is unmistakable, and, besides, they increase and decrease in speed as the motor is speeded up or slowed down. It is the irregular squeak, starting and ceasing without apparent cause, that is hard to trace. Very often it will be found to be caused by the edge of some sheet metal part, such as a pan, or part of the hood, scraping against something when set in motion by the vibration of the car or of the motor. Oil is of little use in such instances, the only remedy being to separate the offending parts or prevent their relative movement.

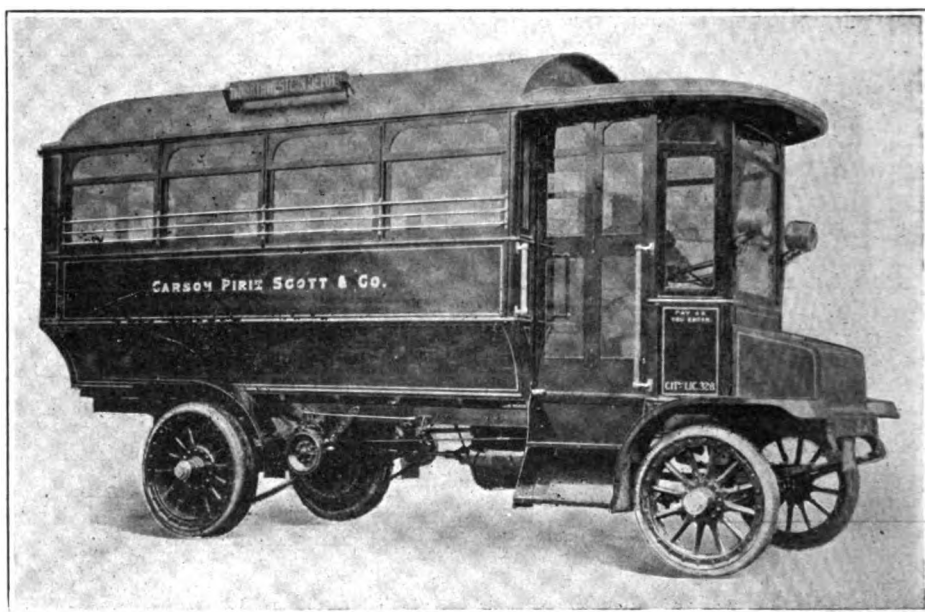
FIRST OF FIELD BUSES PRODUCED

Electric Vehicle Embodying Ideas of a Railroad Engineer—Big Chicago Store Secures Initial Output.

The Electric Omnibus Corporation of New York which was incorporated with \$100,000 capital some six months ago to manufacture electric omnibuses equipped with the Edison battery exclusively, has placed its first productions with Carson, Pirie, Scott & Co., of Chicago. These vehicles, of which there are four, are styled the Field electric omnibuses, the name being that of their designer, C. J. Field,

and are run on a regular schedule between the store and the principal railroad stations.

As may be seen in the accompanying illustration there is practically nothing that is radical in either design or construction, the manufacturers having preferred to adhere closely to those features of engineering practice which in the past have proven of genuine merit. There is a single entrance in the front beside the driver, who is completely enclosed and operates the vehicle from the left side. Part of the batteries are placed under a hood in front and the remainder are located under the passenger's seats where they are readily accessible for inspection and charging. The gearing provides a maximum speed of 12



ELECTRIC OMNIBUS CORPORATION'S FIRST PRODUCT—THE FIELD BUS

M. E., who for several years has been a more or less prominent figure in electric railroad circles and who is vice-president and engineer of the new company. Associated with him are Harry L. Van Zile, C. E., who is president and New York representative, with offices at 39 Cortlandt street, Frank Chrysler, C. E., who is treasurer and Selden Marvin who is secretary. The company's works are at Green Island, Troy, N. Y.

Though these buses are the first to be produced by the company and are all of the same size and type it is not the intent of the company to confine its operations to any one size or style of vehicle. In addition it is prepared to supply larger and smaller buses either single or double decked, and seating from eight to 34 passengers. The four which just have been placed in operation in Chicago are arranged to accommodate 18 passengers, and are of a modified "pay-as-you-enter" type, in which the driver serves also as the conductor and collects the fares. The buses are for the convenience of the patrons of the big Carson, Pirie, Scott & Co. department store,

miles an hour and with short boosting charges at the end of each run the buses are able to perform a full day's service of about 80 miles total run. Without boosting, the average mileage on good roads varies from 40 to 60.

The motor is a 60-volt series-wound General Electric machine and drives direct through a cardan shaft and universal joints to a jackshaft from which power is transmitted to the rear wheels through the intermediary of side chains. The controller is operated by means of a lever on the steering column and in order to obviate the possibility of short circuits resulting through the chafing of long wires is located quite close to the motor and in a thoroughly protected position. Two independent brake systems, providing the maximum factor of safety, are used, the emergency brakes acting on the rear wheels and the service brakes acting on drums at the extremities of the jackshaft. The rear wheels are shod with twin solid tires 34 inches in diameter and 3½ inches in section, and the front wheels are equipped with 32 x 3½-inch single tires.

MOTOR POWER FOR "SWING TRUCK"

Demonstration Proving That Even Such Unwieldy Vehicles Can Be Made "Tractable"—Twelve Tons Easily Handled.

Though the use of horses for hauling loads on wagons and trucks of ordinary types is attended with more or less inconvenience, their use in connection with the huge "swing trucks" employed for the transportation of structural steel is even more troublesome, largely on account of

wheel" carried on trunnions that permit a rocking motion in any direction, as well as horizontal swiveling. In fact, the arrangement constitutes practically a very large universal joint. The huge swing truck was deprived of its front wheels and horse pulling gear, and the front "blocking" attached to the turntable on the tractor. Otherwise the big truck, the rear wheels of which are $6\frac{1}{2}$ feet in diameter, was unchanged.

In order to make the demonstration really practical, a load of steel beams, weighing eight tons, was swung under the "reaches" of the truck and hauled for a

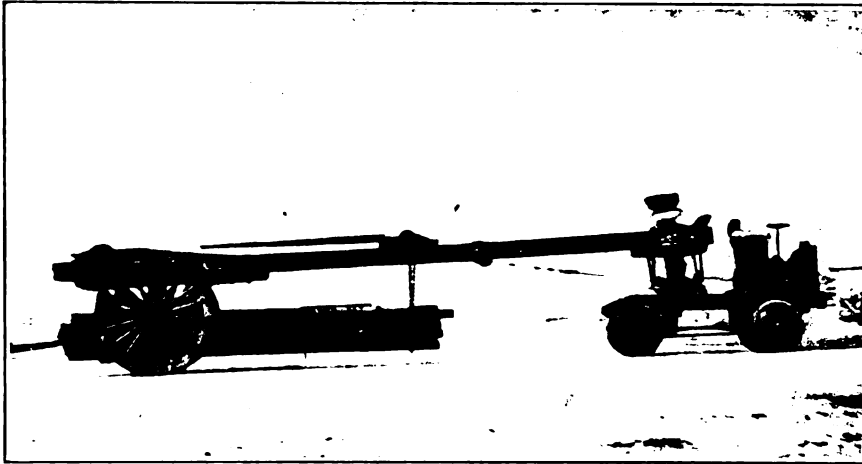
put the rear axle in serious danger of breakage.

While swing trucks rarely are required to ascend grades of much steepness, it was decided to test the reserve power of the tractor on a good hard pull, and for this purpose a "pitch" was selected, having a grade of approximately 13 per cent. Though this was partly covered with ice, the ascent was made without difficulty and with no slipping of the driving wheels. Then the machine was backed half way down and made to pull up from the middle of the grade, which was done without trouble and with considerable power to spare.

From a truckman's point of view, one of the advantages of the tractor is that it can be attached to or detached from the swing truck or any similar vehicle in about the same time it would require to hitch or unhitch horses, so that the tractor can be used with any truck that may be required for the particular work in hand and need not be left idle because there happens to be nothing for one particular truck to do. Owing to its tractive power, the machine is useful also for towing.

To Keep Nuts from Turning.

Not infrequently it may be found that when a bolt in a more or less inaccessible place requires tightening the whole bolt turns. One easy way to stop the bolt turning is to score the inside of the bolt head with a sharp cold chisel. The cuts need not be deep, nor should an appreciable burr be raised or there may be difficulty in

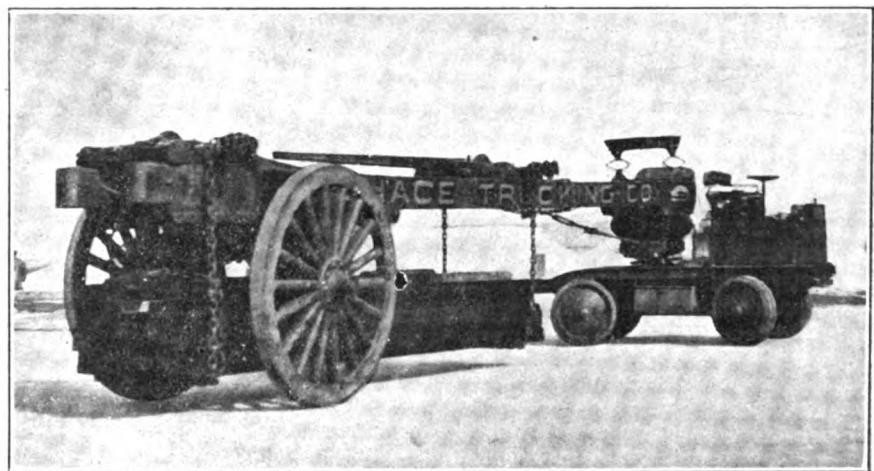


ADAPTION OF COUPLE-GEAR TRACTOR TO SWING TRUCK

the considerable number of animals it is necessary to hitch on when a really heavy load has to be handled. Turning corners is a matter of no little difficulty; and as for backing up it is practically impossible—unless the horses are transferred to the "stern" of the outfit. The streets of lower New York city frequently are partly blocked by swing trucks and their troops of horses when big building operations are under way; and while it would seem that motor trucks readily could be adapted to take the place of horses for this work, for some reason no progress appears to have been made in this direction in New York, though in the West a steam vehicle of the sort has been in use.

The eyes of the trucking fraternity have been opened, however, by a demonstration made one day last week by the Couple-Gear Co. of New York, with one of its four-wheel driven gas-electric tractors coupled to a swing truck belonging to the Chace Trucking Co., of 614 W. 48th street, New York. The tractor, which is equipped with a four-cylinder 45-horsepower gasoline motor direct connected to a dynamo which generates current for the four electric motors enclosed in the four wheels, is similar to the machine used in connection with the fire department water tower, and with heavy coal trucks in New York and elsewhere. The wheelbase is very short and there is no body, apart from the driver's seat; but on the frame, back of the seat, is mounted a turntable or "fifth

long distance. Though the total weight of the outfit, exclusive of the tractor, was something more than 12 tons—eight tons of



SHOWING SHORT TURNING RADIUS WHICH IS POSSIBLE

steel and about four and a half tons for the swing truck—the tractor handled it with ease, and the facility with which backing and other difficult maneuvering was done was quite impressive. As the tractor could be turned so that it was at right angles to the swing truck, turns could be made in the length of the outfit, the wheelbase of which was 35 feet. The speed obtainable was limited because the swing truck is built without springs, and fast running over even ordinary roads would

"drawing the bolt home," no matter how much pressure is applied to the nut, the burr keeping the head of the bolt from bedding down.

The Screwdriver That Is Worth While.

A screwdriver that fits snugly in screw slots, with the least possible room to spare, will be the strongest, last the longest and be the least likely to mar the heads, besides carrying a much greater turning strain without slipping out of the slot.

SMALL ENGINES AND LARGE ONES

English Engineer Undertakes to Compare Them and Deduce Their Respective Advantages—His Opinions.

Is it better that a motor have a short life and a busy one or that it have a longer life and one of comparative ease at the expense of actual efficiency? On the one hand, if the cylinders are small, the gasoline and oil consumption is small, and, operating at nearly full power except for short periods, the efficiency of the motor is high but its life is comparatively short. On the other hand, if the cylinders are larger, which necessitates greater use of gasoline and oil, efficiency will be lower because the engine seldom is operated at full power. However, its life is proportionately lengthened to the amount of work it does and though the balance apparently stands even for this reason, it actually swings an appreciable amount in favor of the smaller motor operating at greater efficiency. At least it does in the opinion of a British engineer, who is at great pains to prove his contention. For genuine economy, he points out, and it might be said in passing that he is not alone in his theory, a motorist must be satisfied with small cylinders and must have, and continually use, a multiple speed gear box so as to keep the engine working at its normal speed and full load at all times.

"Nearly all internal combustion engines as actually constructed are constant speed machines," he says in part. "They are not well adapted for variable speed running. This arises from a number of causes, one of which is very directly connected with the irregularity of crank effort. The extent of negative work, during compression in particular, calls for a considerable amount of energy from the flywheel, and without greatly interfering with the constancy of angular velocity, this is only available at high speed; at reduced speed there is not enough stored energy to do the work. Hence, if for this reason alone, the internal-combustion four-cycle engine must be run at sensibly constant speed if it is to be proportioned to its normal load. That is to say, unless the engine be rated largely in excess of average load torque at less than normal speeds. This points very strongly toward the necessity for a multiple speed gear so used that irrespective of car speed, the engine may run continuously at full speed. The big engine on the light car saves gear changing because it can keep up average torque at low speeds, its maximum load and torque being greatly in excess of the actual work it is called upon to do.

"The gasoline engine is no exception to the general rule that all machines have their highest efficiency of transmission or conversion at or near full load, hence it

may be expected that the small engine run continuously at full load and speed will have a higher mechanical efficiency, and also a higher thermal efficiency, than the large engine run constantly below full load, and in the main below full speed, and this is actually the case. As a set off is the more constant use of a geared speed reducing the transmission efficiency by, say, seven or eight per cent. or a little more, but even so the difference is still materially in favor of the small engine from the point of view of fuel consumption. The constant high engine speed, with very small cyclic speed fluctuations, reacts favorably on the transmission and the tires also.

"The lighter weight is a further advantage, but obviously there is a disadvantage in the increased wear and tear on the engine going always at high speed. In this respect the large engine, run always at a slower speed, and frequently at very low speeds, scores heavily. Its useful or quiet life, and its ultimate life, too, may be expected to be considerably longer than that of the smaller engine. It is in this respect that the owner with a long purse has the advantage—his big-engined car will retain a high proportion of its initial value much longer than will the light-engined car, but he does not by any means save in gasoline consumption in a given performance; on the contrary his luxurious silence, his top gear running, and his increased tire wear all have to be paid for."

Though there is another side to the question and the gasoline consumption actually may be greater with the small engine, due to the greater amount of low-gear running necessary, than with the large engine, the English engineer declares further that this is not so in practice for the reason that "efficiency—mechanical and thermal—will, within certain limits and on the same duty, always be in favor of the mechanism which is worked continuously at or near full load and designed speed." This opinion he backs up by quoting from the Royal Automobile Club records of the recent London to Edinburgh run, a distance of approximately 300 miles.

"No one," he says, "can possibly call into question the high merit, even from the purely economic point of view, of the 40-50 horsepower Rolls-Royce performance of 24.32 car miles or 57.07 ton miles per gallon of gasoline—all on top gear. But as an economic performance alone it is quite put in the shade by the relatively microscopic 13.9-horsepower Delahaye, over the same route and carrying not materially less gross weight, for the fuel consumption of this car works out at 35.73 car miles and practically 70 ton miles per gallon. The former engine had six cylinders measuring 113 x 119 mm. (4½ x 4¾ inches) and the latter, four cylinders 75 x 110 mm (2 15/16 x 4 11/32 inches). It would be preposterous to affirm that the efficiency of the Rolls-Royce during full load is not greatly in excess of the Delahaye during its full load,

but there are two cars doing sensibly the same work within the capacity of the smaller and the smaller is the more efficient in fuel consumption.

"The large car, for the purposes of test, had no gear box, and consequently, at 20 miles an hour, it ran throughout at perhaps one-third load or even less; the small car had, in the Thomas transmission, the equivalent of a gear box with a very large number of speeds, and, moreover, an accumulator to load up the engine when going easy and to help it out when going hard, the net result being that throughout the run the engine would be on full load all the time, up hill and down dale. Excepting for storage the Thomas transmission might be replaced with, say, a six or eight speed gear box, hence its use does not vitiate the comparison in any way.

"Apart from this one question of fuel economy as affected by full load engine running, no one would for a moment compare the luxurious gliding of the Rolls-Royce top speed run with the incessant gear changing (or equivalent) of the Delahaye run. But that one point is so well brought out that the juxtaposition is justified. In this connection it may be pointed out that the result of the light car race on the Boulogne circuit last year very fully confirms the present argument. The track was an open undulating road, and engine capacity was definitely limited. Other things being equal, the race should have been won by that car on which the most complete provision was made for running the engine constantly at the point of maximum efficiency, full speed and load, irrespective of car speed and gradient. The winning car was a Delage, which was provided with a five-speed gear box.

"The conclusion is, therefore, that for any duty within its capacity the small engine will give the highest fuel economy, it will involve the most frequent gear changing, it will have a short and busy life, and incidentally will be easy on tires. The large engine doing the same work must necessarily have a higher fuel consumption, it will call for but little gear changing, it will have a prolonged life, and incidentally it will be somewhat heavier on the tires."

Batteries That Require Slow Soaking.

As a rule, owners of electric vehicles show their wisdom by leaving the care of storage batteries to those who have had experience with them. But there are a few things that are of particular importance to those who either have to or want to do their own tinkering. One of them is to refrain from putting acid in the electrolyte to bring it up to the proper hydrometer test. A cell that tests too low in acid usually needs a long, slow "soaking" or overcharging, which has the effect of driving the acid out of the plates into the solution, and so bringing up the reading. Acid should not be added unless the reading cannot otherwise be brought up.



999,572. Friction Driving Mechanism. Axel R. Le Moon, Chicago, Ill. Filed Oct. 31, 1908. Serial No. 460,442.

1. The combination of a pair of shafts journaled on intersecting axes, a pair of oppositely disposed friction cones secured against relative rotation on one of said shafts, a third cone on the other shaft, the surfaces of said cones being such that each, if continued, would terminate in an apex located substantially at the intersection of the axes of said shafts, one of said shafts being mounted in bearings adapted to oscillate on a transverse axis extending through the intersection of the axes of said shafts and adapted to permit said pair of cones to be brought alternately into mesh with said third cone for respectively driving said shafts in the same or opposite directions, said oscillatory shaft being free to move axially in said bearings.

999,677. Vehicle Seat Back Spring. Charles W. Schultz and Edward A. Sweeney, Detroit, Mich. Filed July 5, 1910. Serial No. 570,251.

A vehicle seat back spring, comprising a frame formed of longitudinal and upright rods secured together, a series of separated and upwardly extending resilient members having their lower ends curved inwardly and upwardly and connected to the lower portion of the frame and their upper ends extending upwardly, rearwardly, and downwardly to points of connection with the upper portion of the frame, coil springs connected to said frame and to the resilient members and alternately arranged near the top and bottom of adjacent resilient members respectively, and ties extending transversely between and connecting adjacent coil springs and in front of and bearing upon the intermediate resilient member.

999,678. Seat Back Spring. Charles W. Schultz and Edward A. Sweeney, Detroit, Mich. Filed Mar. 30, 1911. Serial No. 617,804.

A seat back spring construction comprising a frame formed of longitudinal and upright bars secured together, coil springs mounted on the same to project forward, and a series of upright spring ribbons formed by bending resilient wire to form flat sinuous curves, said ribbons connecting to the frame at their lower ends, extending upward over the fronts of the coil springs, and then forming loops at the top of the frame, their ends connecting to the frame, and small coil springs connecting the upper portion of the adjacent spring ribbons.

999,686. Carburetter. Walter C. Westaway, Rockford, Ill., assignor, by direct and mesne assignments, to Chicago Pneumatic Tool Company, Chicago, Ill., a Corporation of New Jersey. Filed Sept. 28, 1905. Serial No. 280,545.

1. A carburetter comprising a shell or casing provided with a liquid inlet, an air inlet, and an outlet, in combination with a valve pivotally mounted upon the exterior of said casing for swinging movement in proximity to said air inlet adapted to close the same, a rotatable valve mounted upon the exterior of said casing for controlling said liquid inlet, a crank upon said liquid valve and a link connecting said crank to

said air valve whereby upon operating said liquid valve the air valve will be correspondingly operated.

999,689. Automobile Wheel. Andrew W. Wilt, Port Chester, N. Y. Filed Jan. 12, 1911. Serial No. 602,323.

A wheel of the character described comprising an inner rim, an outer rim, springs holding said rims in spaced relation, each of said springs comprising an inner member, and an outer member, one of said spring members provided with a transverse slot adjacent each end, the other of said spring members provided with a lug at each end passing through said slots, means for retaining said lugs within said slots, a hub, and spokes connecting said hub with said inner rim.

999,691. Change of Speed Mechanism. Louis Camille Arnaud, Forcalquier, France. Filed Apr. 28, 1910. Serial No. 558,222.

1. In a change of speed mechanism, a pair of friction wheels, shafts upon which they are mounted, a pair of friction disks, axle journals on which the disks are mounted, axle bearing caps provided with vertical pivots and having hinged to them the axle journals, the axle bearing caps being adapted to slide longitudinally and bring together or separate the disks and the wheels.

999,699. Transmission Gearing for Automobiles. Charles W. Collins, Seattle, Wash. Filed Dec. 29, 1910. Serial No. 599,985.

1. Transmission gearing for automobiles,

Firestone

Tires hold the world's record for durability and speed.

FIRESTONE'S WAY of getting extra mileage out of a tire, is to build extra mileage into it.

That is why "Firestone" Tires cost considerably more to build than others—stouter construction, more durable rubber, more rigid inspection—and why they have never had an off-year.

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INDEX TO ADVERTISERS



A		Goodyear Tire & Rubber Co., The... 912h		P	
Abbott Motor Co.....	934	Grossman, Emil, Co.....	914	Packard Electric Co.....	935
Ajax-Grieb Rubber Co.....	926	H		Parish Mfg. Co.....	920
American Ball Bearing Co.....	919	Hartford Auto Parts Co.....	927	Penn Spring Works.....	914
American Motors Co.....	932	Hartford Suspension Co.....	881	Perfection Spring Co.....	914
American Starter & Carburetor Mfg. Co.....	931	Havers Motor Car Co.....	928	Petrel Motor Car Co.....	931
Anderson Electric Car Co.....	882	Haynes Automobile Co.....	933	Pittsfield Spark Coil Co.....	922
Anderson Spark Plug Co.....	916	Henderson Motor Sales Co.....	934	Pullman Motor Car Co.....	931
Apple Electric Co.....	914	Hot-Spark Plug Co.....	930	Q	
Argo Electric Vehicle Co.....	928	Hupp Motor Car Co.....	916	Queen Mfg. Co.....	918
Automobile Supply Mfg. Co.....	929	Hyatt Roller Bearing Co.....	916	Quimby, J. M., & Co.....	928
B		I		R	
Badger Brass Mfg. Co.....	935	Inner Shoe Tire Co.....	914	Rajah Auto Supply Co.....	935
Barthel, Daly & Miller.....	936	International Accessories Corp.....	923	R. C. H. Corp.....	932
Bartholomew Co.....	934	Inter-State Automobile Co.....	899	Remy Electric Co.....	927
Benz Auto Import Co.....	886	Invincible Starter Co.....	928	Royal Equipment Co.....	930
Bicycling World & Motorcycle Review	916	J		S	
Bosch Magneto Co.....	927	Jamestown Wheel & Mfg. Co.....	920	Sackman Mfg. Co.....	935
Bossert Co.....	930	Jeffery-DeWitt Co.....	930	Safety Tire Gauge Co.....	916
Bower Roller Bearing Co.....	930	Jeffery, Thomas B., Co.....	933	Salisbury Wheel & Mfg. Co.....	936
Bretz, J. S., Co.....	916	K		Schrader's Son, A., Inc.....	926
Briggs-Detroit Co.....	931	Kellom, Chas. F., & Co.....	920	Selden Motor Vehicle Co.....	936
Brown-Lipe Gear Chapin Co.....	929	Kelly-Springfield Tire Co.....	914	Shawmut Tire Co.....	928
Burroughs Adding Machine Co.....	920	King Motor Car Co.....	884	Smith, A. O., & Co.....	935
Bush Mfg. Co.....	914	Kinsey Mfg. Co.....	922	Sparks-Withington Co.....	925
C		Kinsler-Bennett Co.....	935	Speedwell Motor Car Co.....	932
Cartercar Co.....	833	Kissel Motor Car Co.....	873	Splitdorf, C. F.....	927
Century Electric Car Co.....	930	Kline Motor Car Corp.....	936	Springfield Metal Body Co.....	914
Chalmers Motor Co.....	876	Knox Automobile Co.....	928	Standard Roller Bearing Co.....	920
Champion Ignition Co.....	924	L		Standard Oil Co.....	924
Champion Spark Plug Co.....	935	Lauth-Juergens Motor Car Co.....	923	Standard Tire Protector Co.....	914
Clark-Carter Automobile Co.....	928	Leather Tire Goods Co.....	914	Stearns, F. B., Co.....	933
Classified Advertising.....	913	Locomobile Company.....	916	Stewart & Clark Mfg. Co.....	870
Colby Motor Car Co.....	934	Lovell-McConnell Mfg. Co.....	Inside B. C.	Stromberg Motor Devices Co.....	885
Colonial Electric Car Co.....	934	M		Studebaker Corp.....	874
Continental Motor Mfg. Co.....	911	McGraw Tire & Rubber Co.....	925	T	
Covert Motor Vehicle Co.....	932	McIntyre, W. H., Co.....	931	Thomas, E. R., Motor Car Co.....	914
Cox Manufacturing Co.....	877	Mais Motor Truck Co.....	931	Timken Roller Bearing Co.....	883
Cramp, Wm. & Sons, Ship & Engine Building Co.....	929	Marion Sales Co.....	934	U	
Crosby Company.....	932	Mayo Radiator Co.....	871	Union Sales Co.....	931
D		Metz Co.....	934	United Rim Co.....	929
Dayton Rubber Mfg. Co.....	914	Michelin Tire Co.....	887	U. S. Auto Horn Co.....	930
Dean Electric Co.....	872	Michigan Buggy Co.....	932	United States Tire Co.....	Inside Cover-860
Diamond Rubber Co.....	916	Miller, Chas. E.....	871	V	
E		Moline Auto Co.....	924	Velie Motor Vehicle Co.....	931
Electric Welding Products Co.....	921	Mosler, A. R., & Co.....	915	W	
Empire Tire Co.....	932	Moss Photo Engraving Co.....	924	Warner Gear Co.....	929
F		Motor Car Equipment Co.....	914	Warner Instrument Co.....	925
Faries Mfg. Co.....	935	Mott Wheel Works.....	936	Weed Chain Tire Grip Co.....	920
Federal Rubber Mfg. Co.....	875	Motz Tire & Rubber Co.....	914	Western Motor Co.....	929
Fedders Mfg. Co.....	928	N		Wetherill Finished Castings Co.....	936
F. I. A. T.....	916	National Motor Vehicle Co.....	933	Whitney Mfg. Co.....	921
Firestone Tire & Rubber Co.....	912f	New Process Rawhide Co.....	929	Willard Storage Battery Co.....	880
Fisk Rubber Co.....	878	Nordvke & Marmon.....	933	Willys-Garford Sales Co.....	B. C.
Flanders Mfg. Co.....	917	Not-A-Crank Gas Engine Starter Co.....	930	Willys-Overland Co., The.....	888
Ford Motor Co.....	934	O		Winton Motor Car Co.....	932
G		Oakland Motor Car Co.....	933		
Gray & Davis.....	F. C.	Owen, R. M., & Co.....	914		

comprising speed changing gears, shifting devices for the respective gears, a clutch, and clutch operating mechanism, an adjustably movable member for successively actuating said clutch operating mechanism, and a selected one of said gear shifting devices.

999,702. Nut-Removing Device. Walter H. Crilley, Smithton, Pa. Filed Dec. 22, 1910. Serial No. 598,833.

1. In a device for removing nuts, a sleeve adapted to engage a nut and be rotated therewith, said sleeve being of greater thickness than a nut, a sleeve secured to the first sleeve and formed with a threaded

constructed to be adjusted at right angled bore and a stem threaded in the second sleeve and formed on one end with a recess having a threaded wall to engage the threaded end of a bolt and a reduced upper end extended through the sleeve.

999,804. Fender Brace for Automobiles. Johan Lachki, Cleveland, Ohio. Filed Dec. 5, 1910. Serial No. 595,821.

1. An automobile body and a wheel fender extending laterally at the side thereof, in combination with a brace for the fender having a fixed pivot support at its bottom on the side of the automobile body and three several jointed numbers at its bottom

directions one in respect to the other, a turnbuckle connected with the upper of said three members, a fender supporting bracket and a plurality of parts adjustably connected between said fender and said turnbuckle.



THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 10


New York, February 29, 1912

Ten cents a copy
Two dollars a year

The 1912 PIERCE- ARROW Touring Car

will have a body that is a unit, with one straight line flowing from the rise at the back into the curve of the dash. All entrances will be closed by doors, but the opening at the right of the driver will be closed entirely, the levers being placed inside. Nothing will appear on the running board, and the car will have the trim, graceful curves of a well designed yacht.
THE PIERCE-ARROW MOTOR CAR CO., BUFFALO, N.Y.

Published Weekly by The Motor World Publishing Company, Tribune Building, New York



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It is far too
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miss.

THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, February 29, 1912.

No. 10

GIBSON TO REVIVE THE EMPIRE

With Cincinnati and St. Louis Parties, He Forms New Company for Purpose—Headquarters in Indianapolis.

After the deal had been hanging fire for a considerable period, C. E. Gibson, treasurer of the Fisher-Gibson Co., of Indianapolis, and his associates, have consummated the purchase of the machinery and other assets of the Empire Motor Car Co., of Indianapolis, which discontinued operations about a year ago. They will continue the business under the style Empire Automobile Co., which has been capitalized at \$100,000.

The officers of the reorganized Empire company are: A. Waldheim, of St. Louis, president; David May, of Cincinnati, vice-president; Charles D. Sommers, of Indianapolis, secretary-treasurer; who, with Mr. Gibson and David Sommers, of St. Louis, constitute the board of directors. The new company has leased offices at 238½ Massachusetts avenue, but the factory location has not been definitely selected. The manufacture of the Empire car will be recommenced, however. It will be a 25-horsepower model, listing at \$850. Gibson will be factory director and general manager of the Empire company, but will retain his entire interest in the Fisher-Gibson Co., which is one of the largest retailers in the Hoosier Metropolis.

Pratt to Produce Low-Priced Electrics.

William E. Pratt, of the Pratt Mfg. Co., Joliet, Ill., has purchased the personal property of the bankrupt Economy Motor Car Co., of that city, and has submitted a bid for the real estate, which probably will be accepted. If such proves the case, Pratt will continue to operate the plant, but instead of producing the Economy gasoline trucks he will manufacture electric vehicles of the light delivery and roadster type. W. R. Everett, formerly president of the Economy company, will be associated with

Pratt, and the electric vehicle which is in prospect is of Everett's design. Several of them already are in use. Pending the settlement of the real estate deal, Pratt will not make any definite statement on the subject but intimates that his electric vehicles will be listed at not more than \$1,000.

Poole Takes Hupp's European Office.

John T. Poole, who, it is fairly safe to say, ranks as the pioneer export manager so far as the automobile industry is concerned, has engaged with the Hupp Motor Car Co., and early in April will leave for Paris, where a permanent office will be established, of which Poole, of course, will be in charge with the title European export manager. The Hupp company already is well represented in Great Britain by a large and wide-awake London distributor, while E. C. Eager, who makes his headquarters at Auckland, New Zealand, is the Hupp permanent representative in Australasia. Poole's experience in the export field dates from the days of the bicycle, since which time he has led three successful American "invasions" in the interest of as many well known American cars.

Warren Doubles Its Capitalization.

In order to increase its manufacturing facilities, the Warren Motor Car Co., of Detroit, has increased its capitalization from \$300,000 to \$600,000. At the special meeting of the stockholders at which this action was taken, Lucius E. Wilson was officially named as vice-president and general manager of the company. The other officers, who were elected at the succeeding meeting of the board of directors, are as follows: President, Homer Warren; second vice-president, Charles Ritter; treasurer, C. Haines Wilson; secretary, R. W. Allen.

Small Failure of Washington Maker.

W. H. Cowant has been appointed receiver for the Washington Motor Vehicle Co., of Washington, D. C., which undertook to build electric vehicles. Its assets and liabilities are small.

BALL BEARINGS CAUSE FRICTION

That Is, Legal Friction, Norma Charging That F & S Is Infringement—Makes Unusual Request in Filing Suit.

That the famous F & S ball bearings, which are handled in the United States by the J. S. Bretz Co., of New York City, are an infringement and "substantial copy" of certain ball bearings invented by one Ernst Gustav Hoffman, of Germany, is the charge made by the Norma Co. of America, in an action which this company filed last week in the United States District Court for the Southern District of New York, against the J. S. Bretz Co. The patents in dispute are Nos. 744,427, issued to Ernst G. Hoffman on November 8, 1904, and 796,648, issued to Carl A. Hirth on August 8, 1905, and the trademark No. 43,038, issued to Hoffman on July 19, 1904.

In the complaint the Norma Co. of America declares that Ernst Gustav Hoffman invented an improvement in ball bearings which he subsequently patented; that shortly afterwards one Carl A. Hirth invented a new style of race for ball bearings, which race was especially adapted to the bearings patented by Hoffman. When patents were issued to Hirth on these races, he assigned and transferred his rights to Hoffman. Soon after this assignment Hoffman died, leaving the patent rights to Hoffman. Soon after this assignment City and Mrs. Amalie M. Becker, then residing at Frankfort-on-Main. Kiddle and Mrs. Becker, on August 1, 1910, transferred their inherited patent rights to the Norma Compagnie, a "Limited" corporation, of Canstatt, Württemberg, especially organized for the purpose of exploiting the "Norma" ball bearings, covered by the patents above mentioned.

In due time the German Norma Compagnie opened an American branch under the style the Norma Co. of America, and proceeded to manufacture and sell the Norma ball bearings. The American

branch found itself handicapped, however, by the existence, on the American market, of ball bearings manufactured by Fichtel & Sachs, of Schweinfurt, Germany, and by the Merkur Mfg. Co., which manufactures, it is alleged, are "substantial copies" of the ball bearings invented by Hoffman and patented by him. It also found, or claims to have found, that the word Norma, as applied to "ball bearings, balls and machine parts in which they are used" and as such protected by German and American trademarks, is "illegally used by the defendant company."

On these grounds, the Norma Co. of America asks damages and an accounting of the profits made by the J. S. Bretz Co., through the sale of the alleged infringing ball bearings; it furthermore asks for an injunction and for the turning over of all alleged infringing ball bearings in possession of the agents, employees, etc., of the Bretz company, to the complainant, or for their destruction by order of the court. The complaint is signed by W. M. Nones, as secretary and treasurer of the Norma Co. of America.

The Bretz company has not yet filed its answer, but it is known that it will enter a vigorous denial and defense.

To Weave Tire Fabric In Connecticut.

The Manhasset Mfg. Co., which recently was incorporated under the laws of Rhode Island, has purchased the former factory of the Monahansett Mfg. Co., in Putnam, Conn., which is being enlarged and equipped with new machinery for the manufacture of tire fabrics. The president of the company, which is capitalized at \$175,000, is Edwin A. Livesey, of Fall River, Mass.; Albert Howarth, of Providence, is vice-president; Roland Ballou, of Woonsocket, treasurer; William Lees, of Providence, clerk. Messrs. Livesey, Howarth and Ballou, and William Muir and William Bamber, both of Providence, comprise the board of directors, all of whom are interested in the fabric and rubber industries in New England, President Livesey being treasurer of the Standard Fabric Co., which recently was organized to do business in Fall River.

Hoosier Truck Completes Michigan Deal.

Grand Rapids, Mich., having given the necessary support and negotiations having been brought to a head, the Hoosier Limited Truck Co. is now packing up for removal from Decatur, Ind., to the Michigan city, where it already has acquired a part of the former Harrison Wagon Works and also five acres of land. The necessary remodeling of the building is now in progress, and when the Hoosier company completes its removal it will change its title to Grand Rapids Motor Truck Co. It is expected that this will come to pass and the new plant be in operation before the end of March, or at any rate not very much later.

CHARLES LEWIS DIES SUDDENLY

Asthma Carries Off Head of Lewis Spring and Axle Industry—His Busy and Admirable Life.

Asthma, with which he long had suffered, on Saturday morning last, 24th inst., caused the sudden death of Charles Lewis, president of the Lewis Spring and Axle Co., of Jackson, Mich., the "city's foremost manufacturer and a man beloved by everyone," to quote a Jackson newspaper; "a square 'white' man whose success was not gained by stepping upward on the souls of others," to quote an automobile tradesman who knew Mr. Lewis intimately and well. Mr. Lewis was 59 years at the time of his death. He had returned from a visit to New Orleans only the day before and though his malady often had caused him great suffering, serious results were not anticipated when the fatal attack seized him. Mr. Lewis was born in England and came to this country when 14 years old. He located in Jackson, Mich., in 1893, when in a small way he began the manufacture of buggy springs, and later axles, from which the gigantic Lewis Spring and Axle Co. of today gradually developed. He also became interested in other enterprises, among them the E. C. Clark Motor Co., of Jackson, of which he was secretary and treasurer. In all his affairs he earned a reputation as a fair dealing, big hearted, unselfish man. He was no mere dollar-worshiper. He played large parts not only in the industrial life of Jackson but in its civic life, and the esteem in which he was held was indicated by the character of his funeral, which was almost a state affair in which practically the entire city joined. Mr. Lewis leaves a widow, three married daughters and one son, Frederick H., who is treasurer and general manager of the Lewis Spring and Axle Co.

Stewart Speedometer Branch Moves.

The Stewart & Clark Mfg. Co. has moved its Minneapolis branch from 45 South 10th street to much larger and more conveniently located headquarters at 1202 Hennepin avenue, where facilities for installing Stewart speedometers have been secured. The branch will be in charge of T. J. Snelling, who has been in the Stewart & Clark service for some time. A. H. Champlin, who previously managed the branch, will become the outside man, and will cover all of Minnesota—excepting Minneapolis and St. Paul—and all of Iowa.

Americans to Exploit an Italian Wheel.

Having obtained the rights to the Feroci spring wheel, which is the invention of Cesare Feroci, an Italian, Frank Ward has organized the American Elastic Wheel Co., with headquarters at 11 Broadway, New York, for the purpose of exploiting the

Italian invention in this country. Ward himself is treasurer of the company, of which Walter D. Ward is president, and Feroci, the largest stockholder, vice-president. The Feroci wheel, which is covered by United States patent No. 1,010,031, issued November 28, 1911, and applies to an "elastic hub wheel," utilizes the combination of rubber buffer and spiral steel springs, the combination being ingeniously worked out. The fact that the Italian government has used several of the wheels on army trucks has attracted attention to the device in its own country.

Oklahomans Secure a Chicago Truck.

The Tulsa Automobile and Mfg. Co., of Tulsa, Okla., which several months since absorbed the Pioneer Automobile Co., of Oklahoma City, has reached out again and acquired the modest plant of the Harmon Motor Truck Co. of Chicago, which will be removed to Tulsa. By the terms of the consolidation, Mr. Harmon, of the Chicago company, will become vice-president of the Tulsa establishment.

Judgment Against Washington "College."

Judgment for \$2,067.44 against the Automobile College of Washington, which was mixed up in the affairs of the embarrassed Carter Motor Car Corporation, of Washington, D. C., was entered in Circuit Court No. 2, in that city, on Thursday last, the 24th inst. As no defense was interposed the plaintiff obtained judgment by default.

Krit Locates Branch in Philadelphia.

The Krit Motor Car Co., of Detroit, has established an agency in Philadelphia which will be in charge of Henry Lansdale, who formerly was connected with the Fiat establishment. The Philadelphia house will handle Krit business in the eastern half of Pennsylvania, the southern half of New Jersey and all of Delaware, Maryland and Virginia.

Truck Factory for Wormsleyburg.

In Wormsleyburg, which is adjacent to Harrisburg, Pa., J. D. Hipple has broken ground for a factory which will be devoted to the production of motor trucks. The particular vehicle that will be manufactured is a heavy truck, for hauling coal, sand and similar material, which has been designed by C. C. Bennett, of Harrisburg.

Russell Offers Shareholders New Issue.

The Russell Motor Car Co., of Toronto, which recently increased its capital stock from \$1,600,000 to \$2,000,000, is offering holders of its common and preferred stock the right to subscribe at par for the new issue to the extent of one-quarter of their holdings. The new shares are 7 per cent. cumulative preferred.

The Auto Parts Mfg. Co., of Jersey City, N. J., has been elected to membership in the Automobile Trade Credit Association.

GERMANY'S EXPORTS MOUNT HIGH

attained a Value of \$16,500,000 During 1911
—Shipments of Motors and Cars to
America Mysteriously Large.

That no less than \$2,018,809 worth of automobile motors were shipped from Germany to the United States during 1911 is the astounding feature of the German export statistics for the year, which have just been issued. But where these two million dollars' worth of motors went or where they are at present is a question that may fill for the services of such detectives as are described by Poe or Conan Doyle. For according to the statistics published by the United States Government there were imported during the year 1911 only \$347,767 worth of all parts of automobiles, including motors, from all the exporting countries altogether—a glaring discrepancy that gives a glamor of mystery to the German figures.

In the matter of complete cars, too, the German statistics show that the United States took three times as many passenger cars from Germany in 1911 as it did in the preceding year, the figures being 11.85 metric tons and 33.82 metric tons, respectively. The sales to the United States, however, are but a small part of the total German exports of automobiles, these amounting in 1911 to \$16,581,000, as against \$2,356,000 in 1910, an increase of \$4,225,000, or 34.2 per cent. In these figures are included complete cars, motorcycles and motors, the latter being represented by \$1,092,000 and \$4,585,000, respectively. The average value of the 5,136 cars exported in 1911 was \$2,057.

The following table gives the quantities of pleasure cars taken by the twelve leading customers of Germany, expressed in metric tons—which is approximately the weight of a chassis. Roughly, the table therefore gives the number of cars sent to the respective countries:

Country.	1910.	1911.
Russia	72.11	90.95
Great Britain	43.68	70.12
Austria	57.48	60.09
Brazil	76.81	35.66
United States	11.85	33.82
Argentina	14.13	31.34
Netherlands	23.46	28.34
France	24.26	28.27
Denmark	15.12	22.03
Belgium	20.72	15.11
Ireland	4.32	13.91
Netherland Indies	7.03	13.54

Detroiters in a Sectional Solid Tire.

For the purpose of manufacturing a new type of solid rubber non-skid tire, the R & S Tire Co. has been incorporated, with \$15,000 capital, and headquarters in Detroit, Mich. Charles Ritter, who is intimately connected with the Ritter Mfg. Co., builder of automobile tops and other sup-

plies, is president of the new company, and associated with him are H. M. Snyder, of the Snyder-Harbridge Selling Corporation, who is vice-president, and Arnold H. Goss, who is secretary and treasurer, and who formerly was connected with the Buick Motor Co. The tire itself, which is to be styled the R & S, is built in removable sections mounted on a flexible rim, which absorbs road shocks after the manner of a pneumatic tire. The company is located at 247 Jefferson avenue, Detroit.

Receiver for Shelbyville Manufacturer.

On the petition of Louis Hoover and J. A. Akers, owners of 315 shares of stock, Herbert C. Jones was appointed receiver of the Clark Motor Car Co., of Shelbyville, Ind., on Monday last, 26th inst. The application for the receiver states that the company is indebted in the sum of more than \$25,000 and is defendant in civil and damage suits totaling \$40,000. It is alleged that there is but \$1,600 worth of property on hand. The Clark company, which built a car of that name, removed from Anderson, Ind., to Shelbyville about three years ago, when the Commercial Club of the latter city provided the necessary factory buildings, to which the club retains title.

Limousine Bodies Cause Legal Dispute.

Because of a dispute over the workmanship of three limousine bodies, the Moore & Munger Co., of New York, which built the bodies, has entered suit in the New York Supreme Court against Wyckoff, Church & Partridge, Inc., for \$2,991, the agreed value of the bodies, and has asked the court for authority to sell the three chassis to which the bodies were applied, and which are the property of Wyckoff, Church & Partridge. Although the Moore & Munger Co. complains that the Wyckoff company has refused to "look at the work, or approve or disapprove of it, to accept the cars, to take back the chassis or to pay for the work," the Wyckoff concern, in its answer, charges that the work has been inspected and that, as it is not up to their requirements, it refuses to accept it.

Gasolene Goes Up to Twelve Cents.

On Monday last the price of gasolene went up another cent, and now stands at 12 cents, delivered at garages. This is the third increase that has been made within four months, the price which now obtains being the same that ruled three years ago, at which time it began its gradual drop to nine cents. One cent was added to the price only last month.

Equipment Company's Uptown Branch.

The Motor Car Equipment Co., 55 Warren street, New York, formally has inaugurated its branch at 238 and 240 West 56th street, which will be conducted as an exclusively wholesale establishment for the benefit of the uptown jobbing trade. H. H. Seabrook is in charge.

TRUFFAULT-HARTFORD SUSTAINED

Its Shock Absorber Patent Again Declared
Valid by Court of Appeals—
Westen Held to Infringe.

For the second time a United States Court of Appeals has declared the patent covering the Truffault-Hartford shock absorber to be valid, this second decision in favor of the patent having been rendered last week in the appeal from the decision of the lower court lodged by the Westen Mfg. Co., of Trenton, N. J., whose device had been adjudged an infringement of the Truffault-Hartford rights in an action brought by the Hartford Suspension Co. in the United States Circuit Court for the District of New Jersey. The present judgment is in the nature of confirming not merely the lower court, but also the decision of the United States Circuit Court of Appeals for the Second District, which sits in New York.

The Westen appeal was heard by Judges Gray, Buffington and Lanning, who sit in the Court of Appeals for the Third District in Trenton, and who rendered an extended opinion, but which in substance says that they are so "completely and satisfactorily" convinced by the reasonings of the other courts that they adopted these reasonings and conclusions as their own, their judgment being rendered in the following language:

The appeal in this case is from the decree of the court below in the suit brought for infringement of United States Reissue Letters Patent No. 12,437, granted January 16, 1906, to Edward V. Hartford and George H. Hartford upon the invention of J. M. M. Truffault for frictional retarding means for spring vehicles. The decree declared the letters patent valid and infringed by defendant and ordered the usual accounting for damages and profits.

The patent is a reissue of original letters patent No. 695,508, granted March 18, 1902. Its subject matter is thus stated in the specifications, which are identical in the original and reissue patents:

"This invention relates to the class of vehicles in general wherein springs are employed to relieve jolting and vibration, and particularly motor cars and cycles of the various well known kinds.

"The object of the present invention is to overcome or materially modify these shocks and vibrations by combining with the spring supporting device certain frictional devices between the moving parts, or between the running gear and the spring-supporting parts, whereby said frictional devices serve as brakes to retard the too-rapid vibration or movement of the parts."

The defenses set up by the answer are that the claims of the reissue patent are invalid because of laches in applying for the reissue, and because the reissue was not authorized by any statute in such cases made and provided by reason of the unlawful broadening of the claims of said issue. Also that the claims of the said reissue patent are invalid because of the anticipation in prior patents and in public use, and by reason of lack of invention in view of the prior art.

The patent in suit has been the subject of much litigation and we have at least two adjudications prior to the one here appealed from, in which all of the matters here in controversy have been fully passed upon. Suit on the reissue letters patent was brought in the Circuit Court for the Southern Dis-

trict of New York, and upon final hearing in November, 1907, Platt, district judge, in a large opinion deals with the challenged validity of the reissue and says: "I cannot avoid the conclusion that by narrowing the number of means he broadens the scope of his invention." On this ground the bill of complaint was dismissed, with costs (Hartford et al. vs. Hollander, 158 F. R. 103).

An appeal from this decree brought the case for review before the Circuit Court of Appeals for the Second Circuit (163 F. R. 948), and the court discussing at length the sole grant upon which the appeal was dismissed below (to wit: the decreed invalidity of the reissue) adjudged the same to be valid, and assuming the validity of the patent infringement was found and the decree of the court below was reversed.

In October, 1908, in a suit between the same complainants and Joseph Harris, trustee in bankruptcy for the Diezman Shock Absorber Co., bankrupt, on a rule made by Judge Lacombe requiring the defendant-trustee to show cause why an injunction was not issued against him according to the prayer of the bill, and why the infringing device in the defendant's possession and control should not be destroyed, counsel was heard on behalf of both the complainant and defendant and after due consideration an injunction was ordered against the defendant, and further all of the said infringing devices in his custody or under his control were ordered to be destroyed by him in the presence of complainant's counsel (See Record pp. 12-13).

Afterwards suit was brought in the Circuit Court for the Southern District of New York by the same plaintiffs against one Moore (181 Fed. Rep. 132) the bill of complaint alleging infringement by the defendant and praying for an injunction, etc. The same issue was raised by the answer as to the validity of the reissue patent—anticipation and lack of invention—as are here raised, and after final hearing in June, 1910, the court (Hand J.) delivered its opinion sustaining the validity of the reissue patent and of the Circuit Court of Appeals in Hartford et al. v. Hollander, above referred to, and after a full discussion of the other defenses entered a decree holding the patent valid and infringed.

After careful consideration not only of the oral arguments of the plaintiff's counsel on both sides but of their voluminous briefs, we think the learned judge of the circuit court below was right in his conclusion, and that the decree as to the validity of the patent and infringement by the defendant should be affirmed.

It is true that the learned judge in his memorandum said that he doubted that the patented device showed invention, but added that his doubt was not of such abiding or convincing character as to justify him in deciding otherwise, and that he was, therefore, constrained by the prior adjudications that had expressly adjudicated the validity of the patent. The learned judge, however, has no difficulty in finding the defendant guilty of infringement. A careful consideration of the expert testimony and the exhibited drawings of the defendant's mechanism compels us to agree with the court below that they embody the same idea of means as found in the complainant's device in absorbing the shock created by the greater movement of the body of the car toward and from the springs, and particularly as to the rebound when the greater obstructions to the movement of the automobile are encountered. We also agree that the fact that in defendant's device there is presented both a lesser and a greater area of friction surface, while in complainant's there is but one corresponding to the greater of defendant's and that in the lesser up and down movements of the car only the lesser friction device of the defendant is employed is no answer to the charge of infringement. When it is greater the friction device is used in the greater movements of the car. Undoubtedly, as the learned judge says: "If the defendant's device had been a part of the prior art the complainant's would have been clearly anticipated thereby."

We think, however, the reasoning of the Circuit Court of Appeals in the case referred to is quite conclusive as to the validity of the reissue of the patent in the suit and precludes the necessity of further discussion on that point by this court. We

think also that the opinion of the Circuit Court for the Southern District of New York, delivered by Judge Hand in the case of Hartford et al. v. Moore (supra), clearly and satisfactorily discusses and disposes of every important question raised in the present suit touching the validity of the patent whether depending on its relation to the prior art or upon the patentable invention that may be involved therein. After the filing of this opinion an application was made and granted for a rehearing, or on the ground of certain prior uses discovered by the defendant embodied in the Columbia bicycle and the Victor bicycle, in which friction joints were alleged to have been used which embodied and anticipated the essential feature of the complainant's device.

After rehearing Judge Hand refused to disturb the decree already made and accompanied his refusal by an opinion in which he exhaustively discussed these alleged prior uses. The learned judge finds that these rotary frictional joints disclose nothing that was characteristic of the patent in suit and "consisted only of a specific use, or rather misuse, of the machines which themselves contain no suggestion of the patent."

The reasoning of both the original opinion and the opinion on the rehearing was so complete and satisfactory that we have determined not to encumber the reports by attempting to add another and independent opinion to those to which we have referred. As we have said, they completely and satisfactorily to this court cover the questions involved in this appeal. Adopting, therefore, the reasonings and conclusions reached by the courts referred to in both cases, we affirm the decree of the court below.

Changes Among Prominent Tradesmen.

Charles S. Monson, well known to the automobile trade, has been appointed sales manager for the Detroit Electric Appliance Co., of Detroit. He assumes his new duties to-morrow.

P. E. Sands, for three years manager of the Studebaker branch in Seattle, Wash., has resigned that office to go into business of another nature. He has been succeeded by W. C. Graby, of Portland.

H. G. Kiefer has been appointed chief metallurgist of the newly created metallurgical department of the Timken Roller Bearing Co., of Canton. He previously was assistant metallurgist of the H. H. Franklin Mfg. Co.

P. B. Simmons, former branch manager of the United States Tire Co., at St. Louis, and H. H. Hubbard, manager of the same company's Indianapolis branch, have exchanged positions. Simmons is a former Indianapolis man, and consequently is not located in strange territory.

Robert Pierpont has been appointed assistant general manager and production engineer of the King Motor Car Co., of Detroit. As he has had long experience with the Olds, Buick and Locomobile companies, it goes without saying that he is qualified for his new duties.

William A. Somerville, of Detroit, formerly advertising manager for the Warren Motor Car Co., and the Rapid Motor Vehicle Co., has been appointed advertising manager of the Stromberg Motor Devices Co., of Chicago. He assumes his new duties on March 1st.

G. H. Hewitt, formerly chief inspector for the F. B. Stearns Co., of Cleveland, O., and previously superintendent of the Gar-

ford Co., has resigned that office to become superintendent for the Northway Motor and Mfg. Co., of Detroit. Before leaving the Stearns company, Hewitt was presented with a cut glass punchbowl and service by the officers and employees of the company.

T. R. Burton, manager of the Pittsburgh branch of the United States Tire Co., has been appointed assistant to O. S. Tweedy, Eastern district manager of this concern, succeeding C. A. Gilbert, who last week left for San Francisco to become manager of the Western district. Burton, of course, will remove to New York. His successor in Pittsburgh will be C. C. Gehring, who during the past year has been connected with the United States Tire Co.'s Philadelphia branch.

Plummer Again Heads New York Dealers.

J. F. Plummer, manager of the Locomobile branch, was re-elected president of the Automobile Dealers' Association, of New York, at the annual meeting of the board of directors, which occurred yesterday. C. P. Skinner, of the Mitchell Motor Co., was re-elected secretary-treasurer, and Frank Eveland, manager of A. G. Spalding & Bros., was elected vice-president to succeed Sidney B. Bowman. The remainder of the board of directors consists of M. J. Budlong, Packard Motor Car Co.; R. D. Garden, Harrolds Motor Car Co.; H. M. Bronner, Stoddard Motor Car Co.; who were re-elected, and H. S. M. Mead, Lozier Motor Co.; C. M. Brown, Winton Motor Carriage Co.; A. L. Newton, Buick Motor Co., and Arthur M. Day, of the A. E. Ranney Co., who entered the board at the general meeting of the members, which occurred last week.

Stewart Speedometer Branch in Boston.

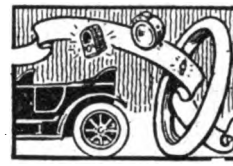
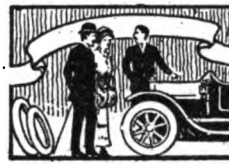
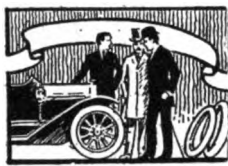
The Stewart & Clark Mfg. Co., of Chicago, has opened a branch in Boston to facilitate the distribution of Stewart speedometers throughout New England. The establishment will be managed by E. G. Biddle, who formerly was with the Veeder Mfg. Co. but who latterly has been a Stewart traveler in New York State.

Federal Tire Branch Opens in Boston.

The Federal Rubber Mfg. Co., of Milwaukee, Wis., has leased headquarters at 261 Dartmouth street, Boston, Mass., which will be operated as a New England branch. It will be in charge of Chase Langmaid, an old tire man, who, however, for some time past, has been manager of the Autocar branch in Boston.

New England Distributors for King Cars.

S. J. Wise & Co., the New York firm which recently established a branch in Boston, at Boylston and Fairfield streets, has secured the New England distributing agency for King cars. In conjunction with the branch a thoroughly equipped service department will be maintained.



G. M. Dyer is building a garage in Spencer, Ia.

C. J. A. Forrell, Jr., is about to open a garage in Iron Mountain, Mich.

Beckwith Brothers is the style of a new firm which has established a garage in Mt. Pleasant, Ia.

Ed. Hunt and Gustav Lienau have formed a partnership and opened a garage at Sawyer, Wis.

Ackley, Ia., soon will have a modern garage of brick and fireproof construction; Blake & Wagner are building it.

Another automobile firm is to "open up" at Atchison, Kans. It is to be under the guiding hand of Richard Dazelle.

The S. K. F. Ball Bearing Co., of New York, has opened a Chicago branch at 1505 Heison building. It is in charge of C. A. Winn.

The first automobile salesroom just has been opened at Donaldsonville, La., by F. H. Allen, who will handle the Metz run-about.

The Eldridge-Beebe Auto Co., of Marshalltown, Ia., has disposed of its business to T. S. Barbour, who will continue it under the same style.

A garage and repair shop has been opened at 1040 Helena avenue, Helena, Mont., by J. C. Hebert, J. J. King and W. A. J. Thompson.

W. R. Moore, formerly with the B. F. Goodrich Co., has opened a salesroom at 14 East street, New Haven, Conn. He will handle the King car.

L. B. Warren has established a salesroom and service department at 338 Newbury street, Boston, Mass. He will handle Cutting and Austin cars.

New headquarters have been opened at 853 Carondelet street, New Orleans, La., for the display of Amplex cars. V. Durand is the manager of the branch.

Hans Fast, who conducted a garage at 834 Muskego avenue, Milwaukee, Wis., has filed a petition in voluntary bankruptcy. He gives his liabilities as \$22,316.54 and his assets as \$38,033.68.

The Everitt Auto Co. has opened salesrooms to the Baltimore (Md.) public at 1200 Mount Royal avenue. F. E. Amgee, H. B. McGinn and C. E. Hunter are the partners in the new concern.

An involuntary petition in bankruptcy has been filed against the Piedmont Auto Mfg. Co., of Atlanta, Ga., by Herman A. Longshore. No schedule of assets and liabilities has been prepared so far.

Leonard D. Masford, of Flatbush, has purchased the garage formerly occupied by the Newkirk Garage & Taxicab Co., at the corner of Newkirk avenue and Brighton Beach road, Brooklyn, N. Y.

James S. Robbie and Thomas Catherwood have purchased the Dallas (Tex.) Garage from D. F. Harris, the former owner. They will conduct the business under the firm style Robbie & Catherwood.

F. Hamer, who owns a farm in Bates County, Mo., has traded his property for the automobile business of Stopher & Keeley at Sterling, Kans. With his son he will do business as Hamer & Son.

H. W. Marshall and F. C. Parsons, of Washington, D. C., have formed a partnership under the style Marshall & Parsons Co., with salesrooms at 1315 H street N. W. They will handle S. G. V. cars.

Under the style the California Auto Co. a new garage and salesroom has been opened on West Seventh street, Los Angeles, Cal. Warren gasoline and Columbus electric cars will form the stock-in-trade.

The Ideal Motor Car Co., of Indianapolis, maker of the Stutz car, has leased the premises 524 North Capital avenue, in Indianapolis, which will be maintained as a retail branch. It will be in charge of L. E. Black.

The new firms have "opened up" in Fremont, Neb., Andrew Frandsen and Ed Morse starting a taxicab business, and Jesse Ruwe and Henry Hoelscher an automobile salesroom. Both concerns are located in the same building.

The Barry Garage has taken possession of its new building at the corner of Barry avenue and North Clark street, Chicago, Ill., where Ford, Marion and Hupmobile cars will be shown. The new structure is a modern, fireproof establishment.

Under the style the Ohio-Marathon Motor Sales Co., a new company has been formed at Philadelphia, Pa., with salesrooms at 2037 Market street. A. H. Jenks is manager of the company, which as the name indicates will deal in Ohio cars.

Percy W. Schall and Harry M. Crouch, who formerly were with the Ford Auto Co., of Baltimore, have gone into business for themselves and established salesrooms at the corner of Mount Royal and North avenues. They will sell Paige-Detroit cars.

The J. W. Bowman Co., Boston agent for Stevens-Duryea cars, on Monday last took possession of its new service building in Cambridge, Mass., which is on the opposite side of the Charles River. The new structure is 344 x 90 feet and its equipment is unusually complete.

Henry Lansdale, formerly connected with the Fiat branch in Philadelphia, has severed his relations with the Italian product and become manager of the new Krit factory branch in the Quaker City. He will appoint subagents in various parts of Pennsylvania and western New Jersey.

Fred E. Folger, formerly with the Ford Auto Co., of Watertown, N. Y., has purchased the garage department of the Warner Automobile Co., in the same town. He will occupy the building formerly used by the Warner company and will do business under the style Arsenal Street Garage.

Harry B. Pulsifer has resigned as president and treasurer of the H. B. Pulsifer Co., Worcester, Mass., and has been succeeded by George M. Thompson, president, and Frank Kilmer, treasurer. A. R. Davis, formerly with the Franklin Square Garage, is manager of the reorganized concern.

The Universal Auto Repair Co., of Hartford, Conn., which heretofore has confined itself to the repair business, has established a supply department and will bid largely for that portion of the trade. It already has secured the representation for Batavia tires, Ever-Ready starters and H. M. S. spark plugs.

An involuntary petition in bankruptcy has been filed by the Warner Instrument Co., the Goodyear Tire & Rubber Co. and R. E. Blodgett, against the White Motor Car Co., Nineteenth and Washington streets, Portland, Ore. The petition charges the automobile concern with preferential treatment of creditors, transfer of property and concealment of assets. The creditors, whose aggregate claims amount to \$1,511.86, ask for the appointment of a receiver for the alleged bankrupt company, of which Oliver Huston is the manager.

The Boston branches of the Premier Motor Mfg. Co., Ford Motor Co. and Firestone Tire & Rubber Co. are about to take possession of the handsome six-story structure which just has been completed at the junction of Commonwealth avenue and Beacon street in the New England metropolis. Although housing the three different companies, the structure, which is of the same general exterior appearance, comprises three separate buildings which differ in interior arrangement. The Premier branch occupies the center store and is flanked on one side by the Ford establishment, and on the other, of course, by the Firestone branch. The three companies occupy the entire building, the size of which implies the completeness of their respective equipments.



Dover, Del.—Independent Electric Co., under Delaware laws, with \$40,000 capital; to manufacture electrical supplies.

Portland, Ore.—Pacific Auto Manufacturing Co., under Oregon laws, with \$150,000 capital; to manufacture automobiles.

White Plains, N. Y.—Horton Co., under New York laws, with \$5,000 capital; to deal in automobiles. Corporators—F. B. Van Kleek, E. J. Steutenburgh, E. G. Horton.

Frankfort, Ky.—Nicol Motor Car Co., under Kentucky laws, with \$1,000 capital; to deal in motor cars. Corporators—R. C. Nicol, James W. Nicol, William D. Nicol.

Pontiac, Mich.—C. V. Taylor & Co., under Michigan laws, with \$25,000 capital; to manufacture automobile tops and windshields. Corporators—C. V. Taylor and others.

Chicago, Ill.—Englewood Motor Car Co., under Illinois laws, with \$1,000 capital; to repair automobiles. Corporators—C. A. Londelius, A. Eugene Jackson, John F. Wagner.

Portland, Me.—Gray Auto & Supply Co., under Maine laws, with \$10,000 capital; to manufacture and sell automobiles. Corporators—H. P. Sweetster, Walter J. Hardy and others.

Chicago, Ill.—Hydraerocraft Co., under Illinois laws, with \$50,000 capital; to manufacture flying machines and motor vehicles. Corporators—H. P. Kane, R. Middlekauff, H. S. Grosser.

Birmingham, Ala.—Magic City Touring Co., under Alabama laws, with \$2,000 capital; to do a general automobile business. Corporators—Gertrude Pizitz, Max Pizitz, L. J. Lebanoff.

Chicago, Ill.—Boulevard Motor Delivery Co., under Illinois laws, with \$2,500 capital; to do a general garage business. Corporators—C. H. McDonough, C. D. Black, George H. Davis.

Oklahoma City, Okla.—Skirvin Auto Livery, under Oklahoma laws; to deal in automobile livery. Corporators—B. M. Little, R. L. Makus, J. F. Pribyl, Clifton Johnson, P. E. Lirrie.

Detroit, Mich.—Wilkinson Motor Starter Co., under Michigan laws, with \$50,000 capital; to manufacture engine starters. Corporators—Benson E. Brown, Robert S. Brown and others.

Fort Wayne, Ind.—Fort Wayne Auburn Auto Co. under Indiana laws, with \$20,000 capital; to deal in automobiles. Corporators—J. M. Carmer, Howard C. Hoodelmire, Eli C. Walker.

Indianapolis, Ind.—N. S. W. Motors Co., under Indiana laws, with \$60,000 capital;

to manufacture automobile parts. Corporators—Charles Neasom, Louis Sagalowsky, F. W. Wellman.

Lake Mills, Wis.—Lake Mills Automobile Co., under Wisconsin laws, with \$6,000 capital; to deal in automobiles. Corporators—F. A. Pirvitz, Adolph Voss, Seno H. Kypke, George H. Burns.

Sacramento, Cal.—Remick & Clay Co. under California laws, with \$25,000 capital; to deal in automobiles. Corporators—Ammon Clay, Mabel Clay, J. S. Remick, Kate Remick and J. W. Haley.

Newark, N. J.—Acorn Tire and Supply Co., under New Jersey laws, with \$50,000 capital; to manufacture automobile supplies, etc. Corporators—H. L. Carroll, P. C. Nissley, M. I. Anson, Jr.

Poughkeepsie, N. Y.—Van Benschoten Motor Cab Co., under New York laws, with \$5,000 capital; to operate motor cabs. Corporators—John Van Benschoten, Homer A. Storm, Chester C. Gardner.

Natick, Mass.—Copethorne Demountable Rim Co., under Massachusetts laws, with \$40,000 capital; to manufacture rims, tires and wheels. Corporators—W. E. Copethorne, H. M. Ferguson and others.

Canton, Ohio—Canton Top Rest Co., under Ohio laws, with \$10,000 capital; to manufacture automobile top rests. Corporators—Percy R. Moore, Oliver E. Eschliman, D. L. Helwick, C. W. Miller and C. W. Coe.

Indianapolis, Ind.—Smart Manufacturing Co., under Indiana laws, with \$10,000 capital; to manufacture automobile accessories. Corporators—B. Smart, L. B. Willis, N. J. Shelton, John C. Wilson, McAdoo J. F. Cooper.

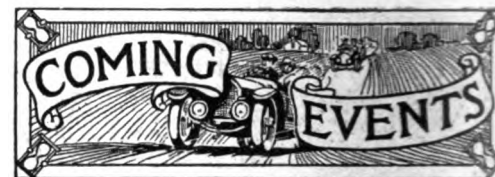
Cleveland, O.—United Automobile Supply Co., under Ohio laws, with \$25,000 capital; to deal in automobile supplies and accessories. Corporators—C. J. Castle, Wm. M. Theobald, C. W. Gabriel, C. A. Fagon and W. J. Schur.

Cliffside Park, N. J.—Cliffside Motor and Supply Co., under New Jersey laws, with \$50,000 capital; to do a general automobile business. Corporators—A. E. Neumann, J. H. Neumann, all of Grantwood, and G. F. Walker, of Cliffside Park.

Indianapolis, Ind.—Electric Light and Starter Co., under Indiana laws, with \$500,000 capital; to manufacture a combination lighting and starting system. Corporators—F. H. Wheeler, J. E. Bell, C. C. Wedding, S. C. Renick and H. J. Spann.

New York, N. Y.—International Automobile Co., under New York laws, with \$10,000 capital; to deal in automobiles. Corporators—Robert K. Haas, 7 East 69th street; Harry B. Ham, Mexico City; Geo. B. Haas, 100 Broadway, New York City.

Brooklyn, N. Y.—Greenpoint Taxicab Co., under New York laws, with \$10,000 capital; to operate taxicabs. Corporators—Charles W. Hoppins, 57 Nassau avenue;



February 24-March 2, Brooklyn, N. Y.—Brooklyn Motor Vehicle Dealers' Association's annual show in 23rd Regiment Armory.

February 26-March 2, Paterson, N. J.—Paterson Automobile Trade Association's annual show in Fifth Regiment Armory.

February 26-March 2, Elmira, N. Y.—Elmira Automobile Club's annual show.

February 28-March 2, Davenport, Ia.—Annual automobile show in the Commercial Club building.

March 2-9, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure vehicles only.

March 4-9, Des Moines, Iowa—Des Moines Automobile Club's annual show.

March 4-9, Denver, Colo.—Annual show in Auditorium.

March 12-16, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fourth annual show in the State Armory.

March 13-20, Boston, Mass.—Boston Commercial Vehicle Association's show in Mechanics' Hall.

March 25-30, Indianapolis, Ind.—Indianapolis Automobile Trade Association's first annual show in a tent auditorium covering University Park Square.

April 29-May 4, Burlington, Vt.—Burlington Merchants' Protective Association's annual show in State Armory.

Charles E. Keller, 2 Jewel street; Samuel I. Keltor, 731 Humboldt street, all of Brooklyn.

New York, N. Y.—Requa European Motor Co., under New York laws, with \$10,000 capital; to manufacture motors. Corporators—Leonard F. Requa, 267 West 79th street; Frederick Charaway, 517 West 21st street; Edward S. Beach, 149 Broadway, all of New York City.

Increases of Capital Stock.

Chicago, Ill.—French Auto Top and Supply Co., from \$5,000 to \$8,000.

Buffalo, N. Y.—Buffalo Gasolene Motor Co., from \$100,000 to \$200,000.

Recent Losses by Fire.

Chicago, Ill.—A. G. Catelain's garage and repair shop, 1446 Indiana avenue, destroyed. Loss, \$15,000.

Chicago, Ill.—Staver Carriage Co.'s cushion department damaged by spontaneous combustion. Loss, \$5,000.

Detroit, Mich.—Goodyear Tire & Rubber Co.'s branch at 251 Jefferson avenue, east, destroyed. Loss, \$200,000.



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HEAT WHICH "VALVELESS" INVENTORS OVERLOOK.

In their haste to eliminate the poppet valve, inventors of that class apparently have overlooked one essential feature which in the light of past experience is of vast importance; it is simply that under varying degrees of temperature all metals expand and contract more or less. Excepting only those engines which are of the concentric sleeve valve type, many of the newer poppet-valveless motors which during the past few months have made their appearance have variously sized and variously shaped valve pockets cast integral with the sides of their cylinders.

The presence of such pockets suggests of itself what their designers appear to have forgotten, namely, that when heated they may be responsible for a certain amount of distortion which is not likely to have a good effect on the efficiency of the engine. In certain types of engines in which the valve pockets are quite close to the top of the combustion chamber the effect of the distortion on the cylinders may be so slight as to be practically negligible.

In the case of the ordinary poppet valve engine, for instance, the valve pockets are well above the cylinder walls and such distortion as may take place can have little if any effect on the ultimate shape of the cylinders even when the engine becomes abnormally overheated. Similarly, the concentric sleeve valve type of engine is free from the possibility of irregular distortion for the reason that the cylinder walls are of a practically uniform diameter for their whole circumference and the expansion and contraction are uniform. In other designs, however, in which the valve pockets extend for practically the whole length of the cylinders,

the liability to unequal distortion and consequent harmful results is a matter which scarcely requires to be enlarged upon.

Just what might be the result of such distortion it is difficult to determine, though it appears that scored or oval cylinders, with consequent loss of compression and power at higher speeds, could be traced directly to such a cause. Not in a day or a week or month, perhaps, would the result become apparent, unless the distortion were exceptional, though it is incontrovertible that the effect must appear in time. For the reason that the distortion is but temporary and is apparent only when the engine becomes heated, it is difficult to provide for it, though it is probable that the difficulty eventually will be overcome as others have been overcome before it.

THE MYSTERY OF GERMANY'S GASOLENE MOTORS.

No person of even small inquisitiveness can pass over the glaring discrepancies shown by the respective export and import statistics of the German and the United States governments, without evincing a keen desire to discover the "reasons why."

How it can be possible for one country to send \$2,000,000 worth of automobile motors to the United States, during a year when the entire importation of automobile parts from all the leading automobile-exporting countries into the United States amounted to barely \$350,000, and automobiles themselves to but \$2,000,000—according to the official reports of the United States Department of Commerce and Labor—is a problem which would tax the solving powers of a Sherlock Holmes.

But even granting that these \$2,000,000 worth of gasolene motors have been brought into this country in such a mysterious way as to elude the watchful eye of the customs officers—a possibility so remote as to almost become an impossibility—the still more interesting questions arise: Who bought the motors? and where are they now? So far as is known there is no American automobile manufacturer who uses German-made engines in his cars; the three German factory branches in this country could hardly have taken more than \$100,000 worth of the motors; no German steamships have been lost enroute to America—what, then, has become of the 6,000 or 7,000 engines which are claimed to have been sold here?

The situation is somewhat analagous to that existing during the heyday of the bicycle, when great quantities of bicycles were listed in German statistics as having been shipped to the United States, but which failed to make their appearance either in the United States import statistics or on the roads of North America, where a German bicycle was as rare as a white blackbird. The mystery of these missing bicycles still is unsolved, and, if anything, is increased by the great influx of German motors which the German records show were headed in this direction but which appear to have been lost or stolen enroute. As there is no reason why the United States government should "doctor" statistics, and as the Germans would seem to have little to gain by "faking figures," almost any one may be pardoned for dipping into vernacular and repeating the oft-asked: "What's the answer?"

"This is a motor truck year," sapiently remarks a contemporary. In which respect it differs not at all from last year or several years before and is not likely to differ from very many years to come. That wise and far-seeing observation deserves a niche in the hall of fame alongside that other refreshing discovery, "The automobile has come to stay."

MCCORMACK DISCUSSES WORM GEAR

Visiting English Manufacturer Finds Lots of Merit in Bevels—Advantages and Uses for Both Types.

Those who share the more or less general belief prevailing on this side of the water that practically all of the British automobile manufacturers have "gone over" or are one the point of "going over" to the worm gear are likely to receive at least a mild shock should they encounter Arthur McCormack, managing director of the Wolseley Tool and Motor Car Co., Ltd., of Birmingham, England, who now is in this

vital part of the car, is nearest the ground, and if it strikes an obstruction in the highway a serious accident may result. Good ground clearance is so essential that we are not using worm gears in our big cars.

"The Wolseley company is installing the gear only in its smaller, lower-priced cars. On the level city streets and good pavements there isn't much likelihood of striking obstructions, and then the small car isn't so heavy and doesn't run at such a high rate of speed. On town cars the worm gears are not only noiseless but do not need the care and adjustment the bevels require. In truth, there are no adjustments and therefore no annoyances for owner or builder. In high-powered cars selling from \$5,000 to \$6,500 we use bevel

tion bearings. But unless the machine work is absolutely accurate and the metal the best the market affords worm gears are self-destructive. If a worm gear is poorly designed and carelessly made of mild steel it will wear itself out, grind itself to pieces, in a very short time, whereas the only drawback of the imperfectly made bevel is the noise.

"No matter how poorly constructed the bevel is not as self-destructive as the worm. It never can be so silent, and unless manufacturers can give time and thought to the making of worm gears they would better leave them alone. The least inaccuracy in construction or adjustment, or the use of inferior materials, is fatal. The life of a loosely constructed worm gear is bound to be short. There are many kinks in manufacture which the builder only learns from experience. He has to do a lot of experimenting before he hits the right types and materials for noiseless construction.

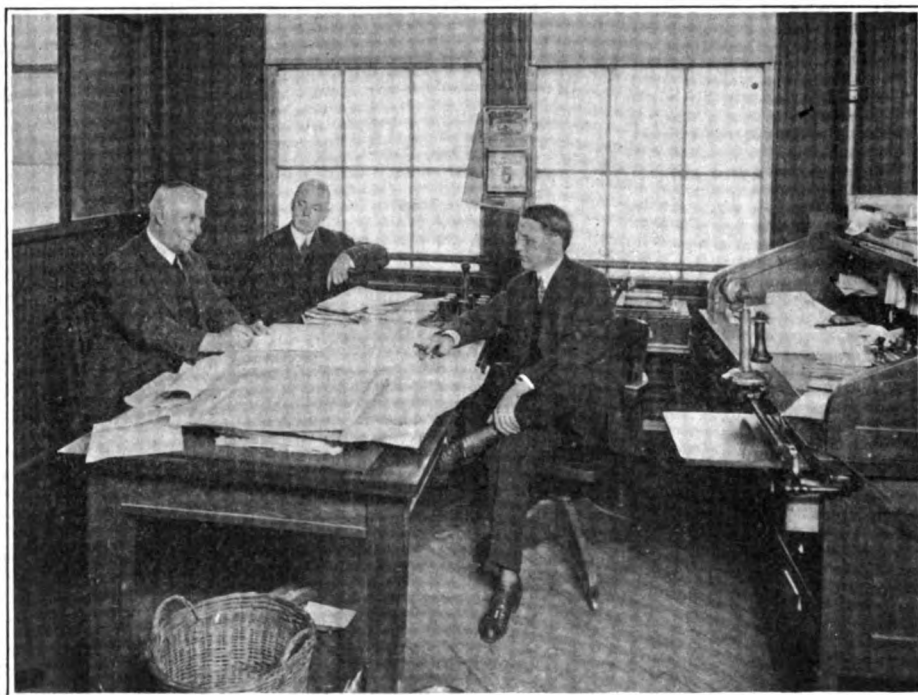
"Straight worm or hollow worm—which is the better?" repeated Mr. McCormack, in reply to the inquiry. "That is the question which is bothering engineers. After lengthy tests and after giving the matter great consideration, I pin my faith to the straight worm. The hollow worm is more difficult to make and to adjust. Any inaccuracy, however minute, makes it immeasurably inferior to the straight type. After threshing over the subject during the three years we have been making worm gears, the Wolseley company has come to the conclusion that the best worm drive is the straight worm drive. For all-around efficiency and long life we do not believe that the hollow worm drive will compare with it at all. We are equipping 2,000 of our small cars annually with the straight worm drive and I want to tell you they are giving perfect satisfaction and causing no trouble."

"Do you believe in worm gear drives for trucks?"

"No, I do not," replied the English expert. "I don't believe in worm gear drive for trucks for the simple reason that it increases the unsprung weight of the axles. Truck makers who adhere to chain drive construction, a dead rear axle and a jack shaft are working along the right lines."

Panhard Adopts Four-Wheel Truck Drive.

Panhard & Levassor, the noted French firm of automobile manufacturers, have added to their productions a new commercial vehicle which is radically different from anything that ever has come from the Panhard factories. It is one of the first commercial vehicles, if not the first, to be regularly equipped with a six-cylinder engine, the cylinders being separately cast and measuring 100 mm. by 140 mm.; it is rated at 34 horsepower at 1,000 revolutions a minute. What is more surprising, however, the truck is both driven and steered through all four wheels, the method of driving being unusual and incorporating a unique type of differential mechanism.



ARTHUR MCCORMACK; AND A. R. DEMORY, FACTORY MANAGER, AND H. W. ALDEN, CHIEF ENGINEER, OF THE TIMKEN-DETROIT AXLE CO.

country to "see what he can see." He has talked much of worm gears since he has been here, and when met one day last week in the general offices of the Timken-Detroit Axle Co. he smiled when his opinion of the worm gear was sought—smiled as if he had heard the question before, several times before; as, indeed, was the case.

"Worm gears, properly designed and constructed of the best materials, are not only noiseless, but efficient, durable, simple, singularly free from adjustment and cause car owners no trouble or annoyance," he said, in reply to the question. "Yet if I could make dead silent bevels commercially I wouldn't make worms at all," he confessed to an informal gathering of automobile men. "The worm gear—at least when the worm is placed below the worm wheel—decreases road clearance to such an extent that it is dangerous to drive a big touring car at high speed over rough country roads. The worm gear case, the most

gears exclusively. We go to a great deal of expense to make them silent and they are giving very good satisfaction.

"As far as efficiency goes the Wolseley company can't measure the difference between bevels and worms," admitted Mr. McCormack. "Let us build two automobiles just the same, except the type of gear in the axles, and actual driving and block tests will not disclose any difference in efficiency between worm and bevel.

"Silence, as I said before, is the aim of all English motor car manufacturers. This is the noiseless age in motor car construction. All the accuracy one can command in making a bevel gear will not assure continued noiselessness. It is necessary to keep constantly adjusting the bevel gear.

"On the other hand noiselessness, dead silence, is the chief characteristic of the worm gear if properly designed, correctly made of the highest grade materials and accurately mounted on the best anti-fric-

SHOW THAT MORE THAN PLEASES

Brooklyn Exhibition Ticks Palates and Otherwise is Satisfying—One New Truck and Several New Accessories.

In addition to pleasing the eye of all who saw it, the Brooklyn show actually tickled the palates of at least 500 women each night. The palate tickling began at the very opening of the show, on Saturday, 24th inst., and was caused by the distribution of 500 boxes of bonbons to the first 500 women who entered the building in which the

rows of them, are entwined with shrubbery, and the light emitted is softened by the substitution of yellow globes for the usual plain ones. The exhibitors' booths are not partitioned off, the signs, in the shape of a shield, which bear the names of the different makes of motor vehicles, are supported on ornamental structures composed of two fluted columns with laurel entwined lattice work between them. The columns are capped with Doric capitals on which rest sills topped with three lamps of attractive design. The names of the exhibitors are painted on the sills.

It is scarcely conceivable that anything should appear at the Brooklyn Motor

acetylene engine starter, the Blitzen, made by the Henry Mfg. Co., of New York City, is shown by the Brooklyn agents, Bishop, McCormack & Bishop. A new tire, the Giant, is displayed by the Mechanical Rubber Co., of Brooklyn, while the Trautman Air-Rubber Tube Co., also of local origin, is exploiting a non-puncturable inner tube, the unpuncturable material being a spongy substance. The Golde top, a single bow creation, operated by one hand, is another novelty in evidence.

Seventy-two different makes of motor vehicles, both pleasure and commercial, gasoline and electric, are staged by 54 exhibitors; the accessory booths are fairly



LOOKING DOWN THE CENTRAL AISLE AT THE "SUNBURST" IN THE BROOKLYN SHOW

exhibition is housed, the 23rd Regiment Armory. Candy as an added attraction is a brand new wrinkle in show promotion, and whether it is the bonbons or something else, it is certain that the building literally was jammed on the opening night, and has been well filled ever since; and this despite the fact that Brooklyn is just across the bridge from that other part of New York City in which two gigantic national automobile shows were held less than two months ago.

The decorations are simple but uncommonly effective. The drill hall has been converted into a massive Spanish garden. The extremely high arched ceiling is entirely concealed by cream tinted draperies edged with crimson "ruffles"; this canopy is so hung that it forms successive waves or billows the entire length of the hall. The ornate chandeliers, there are three

Dealers' Association's affair which was not on view at the national shows held just across the river not long since; this, however, is the case, and the new things are not confined to the accessory department either. The Crawford car, made by the Crawford Automobile Co., of Hagerstown, Md., and staged at the show by the Sterling Place Garage and Sales Co., although not new on the market, is being exhibited for the first time during the 1912 season, while a new local production, made in 1, 1½, 2 and 3 ton capacities, is staged for the first time at any show by the White Star Motor and Engineering Co. The truck is chain driven by a four cylinder motor and is of conventional design. A novelty in the way of a tool for the easy removal of quick detachable rims is incorporated in the Q. D. rim remover shown by Wm. L. Tobey, and a comparatively new

well filled with the products of some 25 dealers. Of motorcycles there are three, the Pierce, Indian and New Era, all shown in various models by one dealer.

The list of exhibitors is as follows:

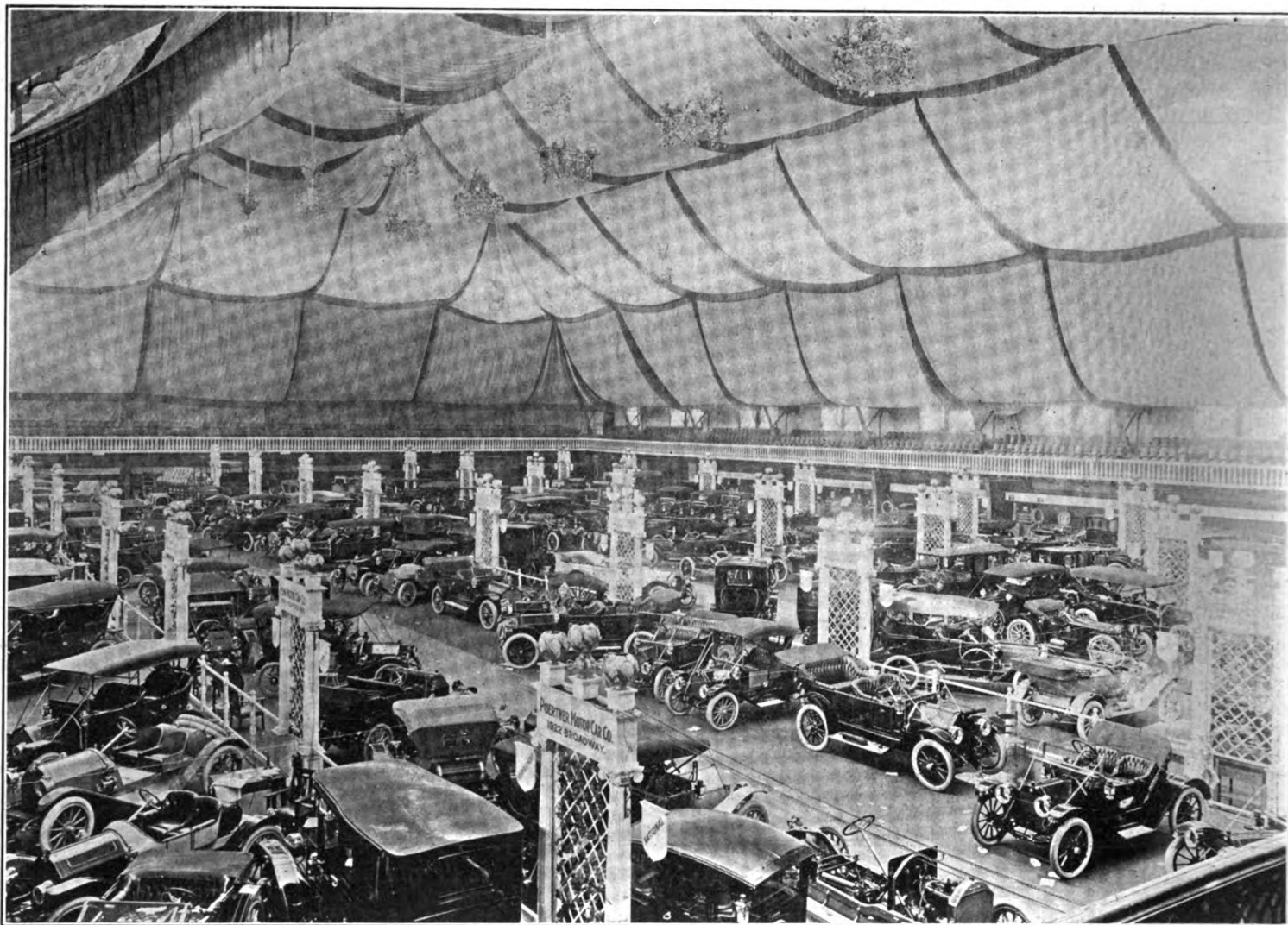
Poertner Motor Co., National and Herreshoff; Penn Motor Car Co., Penn; F. B. Stearns Co., Stearns; E. F. Rau, Krit, Lion and Detroit electric; White Star Motor & Engineering Co., White Star truck; Edwin D. Boldman, Decatur Hoosier; Universal Motor Truck Co., Universal truck; Buick Motor Car Co., Buick; Peerless Motor Car Co., Peerless and Peerless truck, Central Motor Car Co., Otto and R. C. H.; Franklin Motor Car Co., Franklin; Jackson Auto Sales Co., Jackson; Grant Square Auto Co., Cino; C. T. Silver, Overland; Woods Garage and Sales Co., Oakland; Joseph D. Rourke, Haynes; Stoddard Motor Car Co., Stoddard-Dayton; Empire City Auto Co.,

Paige-Detroit and Warren; Parry Auto Sales Co., New Parry and Pathfinder; Regal Motor Car Co., Regal; Bishop, McCormack & Bishop, Ford and Cole; A. W. Blanchard, Inc., Fiat and Case; I. M. Allen, Stevens-Duryea; Marion Motor Car Co., Marion and American; I. S. Remson Mfg. Co., Locomobile; R. M. Owen & Co., Reo and Premier; Bruns Automobile Co., Chalmers and Dayton truck; Thomas Motor Car Co., Thomas; Ormond Motor Car Co.,

mon; Elmore Motor Car Co., Elmore; Pastre's Auto Garage, Inc., Firestone-Columbus and Columbus electric; Bergdoll Motor Car Co., Bergdoll; Sterling Place Garage, Lippard-Stewart truck; Prospect Park South Garage, Crawford; Long Island Commercial Car Co., Knickerbocker truck and Pass delivery wagon; Gramm Motor Truck Co., Gramm truck; Farrell Motor Co., Apperson.

The accessory exhibitors are: Martin,

rain coats; Mechanical Rubber Tire Co., Giant tires; Wenz-Ludy Equipment Co., accessories; Nugget Polish Co., Nugget polishes; Golde Patent Mfg. Co., Golde tops; Julius Bindrum, Witherbee storage batteries, Gabriel rebound snubbers, Cox windshields, Jones's speedometers, Bull's Eye plugs, etc.; O-Tak-A Tire Remover Co., O-Tak-A rim tools for quick detachable rims; John H. Taylor & Bro., accessories; C. T. Cross & Co., sundries; Buck-



GENERAL VIEW OF THE DECORATIVE SCHEME AND THE WELL-FILLED BROOKLYN SHOW

Hupmobile; M. J. Wolf, Kissel and Knox; Packard Motor Car Co., Packard and Packard truck; Carpenter Motor Vehicle Co., E-M-F, Flanders, Garford and Studebaker electric; Wyckoff, Church & Partridge, Commer truck; Montauk Garage, Pope-Hartford and Pope-Hartford truck; White Co., White and White truck; New York Auto Wagon Co., New York Auto Wagon; American Locomotive Co., Alco and Alco truck; Winton Motor Car Co., Winton; Mitchell Motor Car Co., Mitchell; I. C. Kirkman, Maxwell and Columbia; Cumberland Garage, Speedwell and Velie; Detroit-Cadillac Motor Car Co., Cadillac; A. Elliot-Ranney Co., Hudson; Cartecar Motor Co., Cartecar; Marmon Motor Car Co., Mar-

mons; Evans & Co., United States tires, Mea magnetos, Stewart speedometers, Stromberg carburettors, Westen shock absorbers, Weed chains, Klaxon horns, Dorian remountable rims, lubricants, etc.; Young Men's Christian Association, exhibit of method of instruction in Y. M. C. A. automobile school; P. M. Marko & Co., Marko storage batteries; Pyrene Mfg. Co., fire extinguishers; Trautmann Tire Co., Trautmann's Air Rubber inner tubes; Pioneer Auto Top Co., automobile tops; Newmastic Tire Co., Newmastic tires; Charles E. Miller, Pan-American oils, Brampton chains and supplies; Henry Mfg. Co., Blitzen engine starter; George Sumner, Inc., Rayfield carburettors; Hercules Waterproofing Co.,

ley & Rodges, Disco engine starters, Mondex shock absorbers and lighting outfits and mufflers; Long Island Automobile Club, club literature.

One of Senator Clark's "Home Comforts."

In his metropolitan mansion, Senator Clark, of Montana, who, like many other millionaires, prefers to reside in New York, has what appears to be the last word in home comforts and motoring conveniences—a special elevator large enough to accommodate any one of his several cars, and which permits of their being driven aboard directly from the street and the passengers to alight at any desired floor of the Clark home.

DETROIT'S NEWEST CAR OFFERING

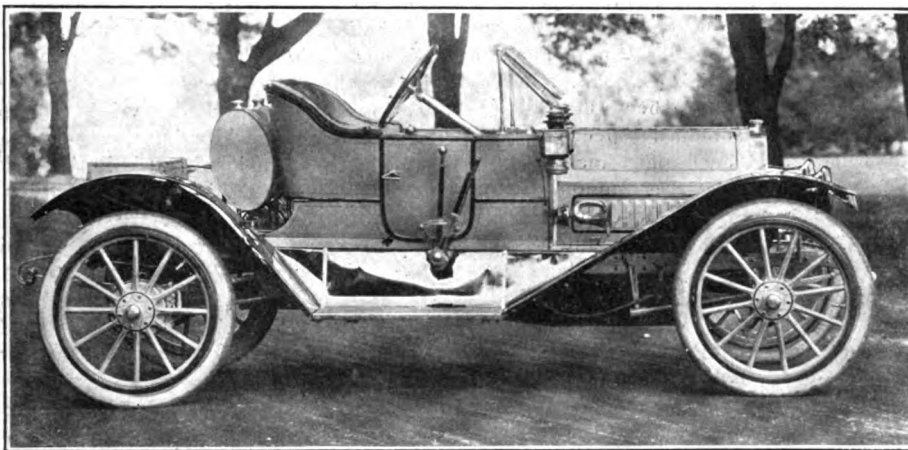
It's the Miller, a Long-Stroke, Medium-Priced Production—Some of the Features That Distinguish It.

That long-stroke motor practice steadily is gaining in popularity in the camps of the American designers is a fact which is self-evident; almost daily additional evidence is piled up, the latest proof being exemplified in the Miller car, a new comer in the medium-powered, medium-priced class, which made its first public appearance at the Detroit show. Its manufacturer, the Miller Car Co., is a relatively new concern, which was incorporated with \$50,000 capital in September last, and of which Theodore Miller is president. Associated with him in the venture are E. L. McMillan,

operated, change gear mechanism, with the control lever placed at the driver's right side; the steering lever is located at the right. The propeller shaft is enclosed in a torsion tube, thereby eliminating separate torsion members, and the drive axles are of the semi-floating type. The frame is of pressed steel in channel section, and is supported in front on semi-elliptical springs and in the rear on scroll elliptic members. Front and rear wheels are shod with 34x3½ and 34x4 inch tires, respectively, the wheelbase of the touring car being 116 inches and of the roadster 110 inches.

British Ideas of Standardization.

Though the movement in favor of standardization, which was founded and fostered in America by the Society of Automobile Engineers, has attained such impetus that its influence is being felt on foreign shores, where it now is being taken up in earnest by the British Institution of



MILLER "30" ROADSTER EQUIPPED FOR THE ROAD

of the National Can Co., who is vice-president, and J. C. Hallock, who is secretary and treasurer. Offices have been established in Detroit in the same building with the Detroit Excelsior Works, of which Hallock is the proprietor, and the affairs of the two companies are otherwise interwoven, the stockholders in both companies being the same.

The car itself embodies no radical features, and is rather a reflection of such standard practice as has proven itself worth while. The motor is rated at 30 horsepower, and is of the L-head type, with the cylinders cast in a single block, and the valve-actuating mechanism enclosed by means of removable metal plates. The cylinders measure 3¼ inches bore and 5 inches stroke, and ignition is effected by means of a Mea high-tension magneto, though a Bosch instrument will be supplied at the option of the purchaser. The thermosiphon system of cooling is employed, and lubrication is by constant level pump-over system.

Power is transmitted to the rear wheels through the intermediary of a leather-faced cone clutch and a three-speed, selectively

What little has been done, however, is in been done in regard to over-size standards. Automobile Engineers, little or nothing has marked contrast to what has been accomplished by the Society of Automobile Engineers, for though the latter body at its last meeting formally adopted over-size standards for cylinders, rather than for pistons, apparently neither will be stocked in increased sizes abroad if the recommendations offered by D. J. Smith at the last meeting of the Institution of Automobile Engineers are accepted. Passing over both pistons and cylinders, he recommended that piston rings be regularly stocked with an increase in size over standard. These are not the only parts which are mentioned in his recommendation, however; other parts of the engine include gudgeon pins, connecting-rod bushes, main bearing bushes, camshaft bushes, push-rod rollers and bearings, and push-rod guides. Chassis parts which in his opinion should be stocked in slightly increased sizes include steering-pivot pins, steering-rod pins, steering-column bushes, worm segment bushes, pins for torque rods, universal joint pins, pins for brake gear and shackle bolts.

TORONTO'S IS A WHALING BIG SHOW

Two Tents Required for Overflow and Not Even Roaring Blizzard Kept Crowds Away—Fine Display of Cars.

Not even a raging blizzard, accompanied by a terrific wind, sufficed to keep the crowds from the opening of the sixth annual automobile show of the Toronto Automobile Trades Association and the Ontario Motor League, in the usual show place—the Toronto Armouries—on Wednesday evening last, February 21st. It was a bumper show—so large, in fact, that it was necessary to pitch two large tents adjoining the Armouries to accommodate the overflow of exhibits. The tents were very strongly braced and they required it to stand up under the combined strain of the howling gale and the weight of the accumulation of snow on the sides and tops. The comfort of the exhibitors who staged their products in these improvised auditoriums was assured by the presence of large furnaces which were installed in the center of each. The formalities of the opening were brief; a few words touching on the progress of automobile development were spoken by His Honor Lieutenant-Governor Sir John Gibson, who, assisted by Lady Gibson, officially opened the exhibition, the band of the 48th Highlanders Regiment played "O Canada," and Lady Gibson gave the signal for the illumination of the building.

The decorations were not unlike those of the Montreal show, the same replica of the royal crown formed the basis of the gigantic chandelier which hung in the center of the drill hall, but in place of the jewels which adorn the original, there were upwards of 1,000 vari-colored electric lights. The entire ceiling was covered by a monster Union Jack formed of red and blue bunting, with the white bars made of wood moulding in which were mounted myriad white incandescents, the chief source of illumination. On all four sides the walls were covered with white and yellow bunting. The same color scheme prevailed in the decoration of the canvas annexes, the illumination in the latter being supplied by strings of incandescents festooned from the center of the tents to the sides.

For the convenience of the exhibitors of American products, which means more than half of the exhibitors, the building was made a bonded warehouse for the week the show was in progress, making the payment of duties on the machines imported expressly for exhibition purposes, unnecessary unless the machines were sold and remain on Canadian soil.

Four comparatively new gasoline pleasure vehicles, all of Canadian manufacture, or rather assembly, were displayed for the first time, also one new electric, the Peck,

made by Peck Electric, Ltd., of Toronto, and four commercial vehicles, of which one, the Foden, is a steam tractor, and is handled by Jones & Glassco, of Montreal. The new pleasure vehicles, the Brockville-Atlas, product of the Brockville-Atlas Auto Co., of Brockville, Ont.; the Clinton, made by the Clinton Motor Car Co., Clinton; the Galt, handled by Canadian Motors, Ltd., and the G. J. G., displayed by J. A. Fitzsimmonds, are all of more or less conventional pattern, as indeed is the case with the commercials, the Clinton truck, made by the same firm which produces the Clinton car; the Petrolia truck, made by Petrolia Motor Co., Petrolia, Ont.; and the Watson-Commerce made by the Watson Carriage Co., Ottawa. The steam commercial, the Foden, is on the order of the English lorry. A very comprehensive display of motorcycles, most of them of American manufacture, are staged by seven dealers. Every inch of space which it was possible to devote to the display of accessories was utilized by 30 accessory dealers, who staged everything in the sundry line.

The exhibitors of motor vehicles were: Automobile and Supply Co., Pierce-Arrow, Stoddard-Dayton, Reo and Hupmobile; Baker Bros., Cole; Brockville-Atlas Auto Co., Brockville-Atlas; Imperial Motor Car Co., Oldsmobile and Oakland; Hyslop Bros., Cadillac; Pope-Hartford Motor Co. of Canada, Pope-Hartford; Montreal Locomotive Works, Alco; Russell Motor Car Co., Russell; Tudhope Motor Co., Tudhope; Ontario Motor Car Co., Packard and Detroit electric; Ford Motor Co. of Canada, Ford; White Co., White; Kissel Kar Sales Co., Kissel; Schacht Motor Co., Schacht; E-M-F Co. of Canada, E-M-F and Flanders; A. E. Wilson, Jackson; Riverdale Garage and Rubber Co., Lion; Dominion Automobile Co., Peerless; Napier, Stevens-Duryea, Hudson and Autocar; Warburton Bros., Maxwell and Interstate; McLaughlin Motor Car Co., McLaughlin-Buick, Fiat and Rauch & Lang electric; Shaw Overland Sales Co., Overland, Garford and Gramm and Garford trucks; Auto Sales Co., Mitchell, Moon and Colonial electric; G. E. McCulloch, Kelly trucks; White-American Sales Co., American; Bouvier & Son, Winton; Virtue Motor Sales Co., R. C. H.; Clinton Motor Car Co., Clinton and Clinton truck; T. Eaton Co., Lozier Chalmers, Waverley electric and Saurer truck; Wolseley Tool and Motor Co., Wolseley; Krit Motor Car Co., Krit; Industrial Motors, Ltd., Commer truck; Canadian Motors, Ltd., Galt; Rambler Motor Sales Co., Rambler; Petrolia Motor Co., Petrolia truck; J. A. Fitzsimmonds, G. J. G.; Peck Electric, Ltd., Peck electric; Jones & Glassco, Foden steam truck, Watson Carriage Co., Watson-Commerce delivery wagon; E. A. Greene Co., Ward delivery wagon; International Harvester Co., International delivery wagon; Flanders Electric Vehicle Co., Flanders electric.

The motorcycle exhibitors were: F. H.

Lemon & Co. Indian; Percy A. McBride, Excelsior and C. C. M.; Motor Cycle Equipment Co., Flanders, Rudge-Whitworth and N. S. U.; Walter Andrews, Pierce and Indian; Tangent Cycle Co., Triumph; Licence Bros., Harley-Davidson; Humphry Bicycle and Motor Co., Merkel.

The accessory exhibitors were: Canadian General Electric Co., K-W ignition specialties; Atwater-Kent Unisparker, Electric Star lighting outfits, Sharp spark plugs, etc.; Canadian National Carbon Co., Columbia igniter and Columbia Multiple batteries; Queen City Oil Co., Gargoyle, Mobiloil, Arctic and Polarine lubricants; Leather Tire Goods Co., Woodworth treads, Kant-Skid treads and repair boots; Gutta-Percha and Rubber Mfg. Co., Fisk tires; J. Millen & Son, Simms magnetos; National Motor Car Accessories, Remy magnetos, Stewart speedometers, Connecticut shock absorbers and Motoroil lubricants; Marburg Bros., Mea magnetos; Triple Tread Mfg. Co., Triple-Tread tire treads; McCord Mfg. Co., radiators; Canadian Consolidated Rubber Co., Canadian tires; Electrical Specialties, Ltd., Gaulois tires, Watson shock absorbers, Ford lighting outfits and Standard speedometers; Stepney Motor Wheel of Canada, Ltd., Stepney spare wheels, tires, pumps, jacks, etc.; Bosch Magneto Co., Bosch magnetos; Dunlop Tire and Rubber Co., Dunlop tires; S. F. Bowser & Co., oil and gasoline storage apparatus; Independent Tire Co., Independent tires; Hall Motor Supplies Co., Red Head spark plugs, Vanguard windshields, etc.; Canada Carbon Co., Ltd., G cell dry batteries; Warner Instrument Co., Warner Autometer; Pollock Mfg. Co., Old Sol lamps; Diamond Tire Co., Diamond tires; Auto Tire Co., Goodrich tires; National Equipment Co., Wayne oil and gasoline storage apparatus; Death & Watson, Ltd., lighting outfits and storage batteries; Conboy Carriage Co., bodies and Clear-Vision and Rain-Vision windshields; Croftan Storage Battery Co., Vulcan storage and Vicor dry batteries; Torono Auto Top and Body Co., tops, trimmings, etc.; Indian Refining Co., Havoline lubricants; Goodyear Tire and Rubber Co., Goodyear and Goodyear-Motz tires.

Native Car at North Carolina Show.

The Charlotte Automobile Dealers' Association's show, which opened in the Charlotte Auditorium on Monday last, 26th inst., for a three-day stand, disclosed among the 15 makes of motor vehicles which were displayed by nine dealers, two which are new to the show circuit for the 1912 season—one a native product, the Corbitt, made by the Corbitt Automobile Co., of Henderson, N. C.; the other, the Whiting, which hails from Flint Mich.

The auditorium was most tastefully decorated for the occasion. From the center of the ceiling stretched in folds a complete enclosure of green and white bunting housing the exhibits under a tentlike covering. Lat-

tice work, strewn with smilax and wistaria, extended along the balconies and stage.

The exhibitors of motor vehicles were:

Osmond L. Barringer Co., Packard, Chalmers and Reo; Corbitt Automobile Co., Corbitt; Ford Sales Co., Ford; Charlotte Motor Car Co., Pullman and Marathon; Piedmont Motor Car Co., Stoddard-Dayton and White truck; C. C. Coddington, Buick and Buick truck; United Motor Charlotte Co., Maxwell; Studebaker Corporation, E-M-F and Flanders; American Motor Car Co., Everitt and Whiting.

Paterson Joins the Show Circuit.

"Everybody's doing it, doing it," so it is little to be wondered at that such a progressive town as Paterson, N. J., should fall in line and inaugurate an annual automobile show. The first attempt was opened in the Fifth Regiment Armory on Monday evening last, 26th inst., under the auspices of the Paterson Automobile Trade Association, and will be the headliner in the local doings for the rest of the week.

The drill hall decorations, though attractive in the extreme, are more or less conventional. The arched roof is concealed by the red and white bunting canopy, the walls are draped with similarly colored draperies, green denim covers the floor and numerous festoons of electric lights supply the necessary brightness. The exhibits—there are some 37 exhibits of different makes of vehicles staged by 22 dealers—are spaced by white corner posts which bear the signs designating the car shown. The accessory department is housed in the gallery and the half score of exhibitors of "little things" handle everything to increase the comfort of an automobile trip.

The motor vehicle exhibitors are:

Eastside Auto and Repair Co., Marion; Riverside Garage, Abbott-Detroit; Bender Motor Co., Havers. B. F. Clickner, Velie; Vernon Ettinger, Reo; Cunningham Bros., Havers; Auto Shop, Chalmers; Hudson Co. of Newark, Hudson; Penn Motor Car Co., Penn "30"; E-M-F and Flanders Co., E-M-F and Flanders; Stevens-Duryea Motor Co., Stevens-Duryea and Chalmers; E. A. Brown Auto Co., National, Maxwell and Cadillac; J. Garlick, Stearns and White; Ford Auto Co., Ford, Everitt and Thomas; Hughes Garage Co., Franklin, Buick and Kelly, and Buick trucks; Pope-Hartford Co., Pope-Hartford; Center Garage, Overland, Columbia Motor Car Co., Columbia and Sampson truck; Autocar Co., Autocar and truck; Crescent Automobile Co., Saurer and Mack trucks; Veerac Sales Co., Veerac and Elmore; Passaic Auto Co., Cutting; S. F. Holden, Metz; Paterson Vehicle Co., International; F. B. Stearns Co., Stearns.

The accessory exhibitors are: Alling Rubber Co., rubber goods; W. F. Davis, typewriters; F. Dodant, motors; N. F. Heil, motorcycles; H. L. Smith, sundries; Suspended Pneumatic Tire Co., pneumatic tires; Standard Oil Co., lubricants; C. B. Vaughan supplies; Wayne Oil Tank and Pump Co.



BOSTON PROMISES "ELEGANCE AND CONSISTENCY"

Spanish Mission and English Estate Effects to Set Off Exhibits at the New England Big Show of Pleasure Cars—Little Novelty in Prospect Save in Decorations and Accessories.

Boston promises that the decorative scheme which will prevail at its annual show, which opens Saturday evening next, March 2d, will be "difficult adequately to

is the New England show and one of national proportions, but coming too late to be of national importance. As usual, it will be staged in Mechanics' Building, but

barring eleventh hour arrivals, there will be displayed but three cars which were not exhibited at the national shows in New York and Chicago—the Empire, the Lenox

OFFICERS OF THE BOSTON AUTOMOBILE DEALERS' ASSOCIATION



J. H. MacALMAN
President



F. A. HINCHLIFFE
Treasurer



CHESTER I. CAMPBELL
Secretary and Manager



E. W. CAMPBELL
Decorator

describe in mere words; it will be one to see and enjoy and the vision of elegance and consistency will charm the most critical."

And it is fair to add that Boston—that is, the Boston Automobile Dealers' Association, and particularly Chester I. Campbell, its secretary—know much more than the proverbial thing or two about shows and show decoration. They never have been content to rest on their laurels as originators of the now general uniform decorative treatment of such public exhibitions; they have gone right on originating and each year the Boston show has been a new treat for the eye and wholly unlike all other such treats.

Of course, every one calls it "the Boston show," but as a matter of fact it properly

for the first time during recent years it will include no commercial vehicles. For Boston—that is, the Boston Commercial Vehicle Association, which is the Siamese twin brother of the Boston Automobile Dealers' Association—has reserved the "commercial" for a show of its own which will not be uncovered until Wednesday, March 13th; the pleasure cars will have vacated Mechanics' Building three days before.

This segregation of the trucks has served to rob the Boston show as heretofore constituted of some of the little novelty it possessed for those who had gone the rounds of the other big shows. For always, or nearly always, there were several trucks at Boston that had been seen nowhere else. Last year there were five of them. This year there will be none, and,

and the Stanley steamer, the two latter New England productions which find their chief market in New England. As usual, most of the cars will be shown by the Boston agents or the Boston branches of the respective manufacturers.

Of accessories there will be the usual wealth; the real novelty will be found in that department. New England is the abiding place of Yankee ingenuity and the Yankee whittler, and it's a poor show in Boston that does not disclose a dozen or so new specimens of the ingenuity or whittling, some of which are seen no more. It goes without saying that there also will be exhibits of dictionaries and souvenirs, and that there will be popcorn, peanuts and red lemonade for sale—they are Boston show institutions—and if the white-gowned fe-

male orchestras do not make the music then will the show be lacking.

Not an apple orchard in bloom nor a wistaria garden will supply the setting for the exhibits. Instead, in Grand Hall, with its lofty dome, will be garnished with suggestions of Mexico and Southern California; there the decorative scheme will be of the Spanish mission type. Exhibition Hall, the larger of the two structures which constitute Mechanics' Building and the one with the ugly naked girders, will be converted into a conventional English country estate.

In Grand Hall there will be a wide expanse of blue sky created with the brush, and arranged along the balcony fronts will be mission arches and other mission designs, all in creamy white plastic effect, suggesting adobe and tile copings. Illuminated bells will hang in the towers, great palms will rise among the buildings, and brick and plastic work serve for the balcony fronts will give the effect. Around the entire hall escutcheons and groupings of illuminated foliage will serve as decorative features. The exhibitors' spaces will be separated by adobe walls, over which flowering vines will trail, and the intersections of the aisles will be marked with posts of mission style, which design will be carried into the sign posts of each exhibit. These sign posts will have tile caps and buttresses and will be topped by illuminated foliage. Sunbursts of electric lights will be suspended over the main floor, and there will be a new proscenium curtain and a gilded orchestra stage.

"Real box hedge, imported for the purpose and preserved by a special process," to quote the official description, will play a large part in converting Exhibition Hall into an English estate. The hedge will be employed to mark the aisles and divide the exhibitors' spaces and provide a base for the English country scene which has been painted to conceal the walls and which will be seen "over the garden wall," so to speak. The girder and post covering is a painted English beamwork scheme, nearly 15,000 square feet of canvas being used for this purpose. The posts are to be treated as part of the beamwork, and climbing rose vines with illuminated flowers are to be used extensively throughout the great, big hall.

The main aisle of Exhibition Hall is to present a beautiful garden walk with hedges jutting on either side at the exhibition space boundaries, and at the end of each hedge illuminated rose trees. Over the aisle garlands of roses and greenery are to be festooned. An especially fine decorative treatment has been designed for the usually ugly light well in Exhibition Hall, including arches of hedge, foliage and sky-colored background. The floor covering will be in keeping with the general scheme, and the signs are to be on individual standards such as were used last year, but of different style and color. They will be finished

in green bronze, with a heraldic shield carrying the name and address of the exhibitor.

The main entrance will be treated in a light tracery in steel, with three illuminated domes in colors. Foliated bands will extend from these to the sides, forming a most attractive arch leading to Exhibition Hall entrance.

The full list of those who are booked to display wares during the week is as follows:

Automobile Exhibitors.

Atlas Motor Car Co.—Atlas.
American Locomotive Co.—Alco.
Andrews-Dykeman Co.—Moon.
Bailey Co., S. R.—Bailey electric.
Bowman Co., J. W.—Stevens-Duryea and Waverley electric.
Boston Electric Garage Co.—Detroit electric.
Buick Motor Co.—Buick.
Babcock Electric Carriage Co.—Babcock electric.
Cadillac Automobile Co. of Boston—Cadillac.
Connell & McKeon Co.—Overland.
Curtis-Hawkins Co.—Speedwell.
Case Threshing Machine Co., J. I.—Case.
Clarke-Carter Auto Co.—Cutting.
Cartercar Co.—Carter.
Columbus Buggy Co.—Firestone-Columbus and Columbus electric.
Dodge Motor Vehicle Co.—Pope-Hartford.
E-M-F Boston Co.—E-M-F.
Empire Motor Car Agency—Empire.
Essex Automobile Co.—Warren.
Fuller, Alvin T.—Packard.
Fiat Automobile Co.—Fiat.
Ford Motor Co.—Ford.
Franklin Automobile Co.—Franklin.
Great Western Automobile Co.—Great Western.
Habich Co., G. E. & H. J.—Cole.
Harrington & Co., J. S.—Chalmers.
Havers Motor Car Co.—Havers.
Hollander Motor Co.—Metz.
Imperial Automobile Co.—Imperial.
Inter-State Automobile Co.—Inter-State.
Jenkins & Co., W. M.—Mitchell.
Jeffery Co., Thomas B.—Rambler.
Jackson Motor Car Co.—Jackson.
Kissel-Kar Co., N. E. Branch—Kissel.
Koehler Sporting Goods Co., H. J.—Hupmobile.
Lozier Motor Co.—Lozier.
Locomobile Co. of America—Locomobile.
Linscott Motor Co.—Reo and Moon.
Lenox Motor Car Co.—Lenox.
Lexington Co. of N. E., Inc.—Lexington.
MacAlman, J. H.—Columbia and Stearns.
Maguire Co., J. W.—Pierce-Arrow.
Massachusetts Motor Co.—Oakland.
Matheson Automobile Co.—Matheson.
Marquette Co.—Marquette.
Middleboro Auto Exchange—McFarlan.
Morse & Co., Alfred Cutler—Renault and S. P. A.
Motor Vehicle Co.—Warren.
Neale, A. F.—Baker electric.

Ohio Motor Car Co.—Ohio.
Oldsmobile Co. of Mass.—Oldsmobile.
Ohio Electric Car Co.—Ohio electric.
Ottomobile Co.—Otto.
Peerless Motor Car Co. of N. E.—Peerless.
Penn Motor Car Co.—Penn "30."
Premier Motor Car Co.—Premier.
Paige-Detroit Motor Car Co.—Paige-Detroit.
Rawles-Cobb Co.—Auburn.
Russell & Co., W. L.—Apperson.
Regal Motor Car Co.—Regal.
R. C. H. Corporation—R. C. H. and Hupp-Yeats electric.
Smith, Fred S.—Mercer.
Stanley Motor Carriage Co.—Stanley Steamer.
Thomas Motor Car Co.—Thomas.
Thomas & Co.—Cunningham.
Tiffany Co., D. C.—Rauch & Lang electric.
Underhill Co.—Knox.
United Motor Boston Co.—Stoddard-Dayton, Maxwell, Brush, Courier, Columbia.
Velie Motor Vehicle Co.—Velie.
White Co., The—White.
White, Ware & Leatherbee—Bergdoll.
Winton Motor Carriage Co.—Winton.
Wing Motor Car Co., F. E.—Marmon.
Whitten-Gilmore Co.—Chalmers and Hudson.
Whitney-Barney Co.—Selden.
Westcott Motor Car Co.—Westcott.

Accessory Exhibitors.

Acme Torsion Spring Co., Boston, Mass.—Acme supplementary springs.
Adams & Co., J. Q., Boston, Mass.—Dictionaries.
Aetna Life Insurance Co., Boston, Mass.—Insurance.
Ajax-Grieb Rubber Co., New York City—Ajax tires.
Allen Auto Specialty Co., New York City—Tire covers, tire gauges, etc.
Aluminum Solder Co. of Boston, Boston, Mass.—Aluminum solder.
American Storage Battery Co., Cambridge, Mass.—Storage batteries.
American Brass Co., New York City—Tobin bronze rods and tubing.
American Technical Society, Boston, Mass.—Publications.
Ames Auto Jack Truck, Franklin, Pa.—Automobile jacks for garage use.
Apple Electric Co., Dayton, O.—Aplco ignition and lighting systems.
Aristos Co., New York City—Mondex shock absorbers, Disco engine starters, Frary lighting systems.
Atlas Chain Co., Brooklyn, N. Y.—Non-skid tire chains.
Autogenous Welding Equipment Co., Springfield, Mass.—Welding tools and materials.
Auto Parts Co., Providence, R. I.—Automobile parts and supplies.
Auburn Auto Pump Co., Boston, Mass.—Tire pumps.
Baum's Castorine Co., Rome, N. Y.—Lubricants and polishes.

Batavia Rubber Co., Batavia, N. Y.—Bata-
via tires.
Blickensderfer Co., G. C., Stamford, Conn.
—Bull's Eye spark plugs.
Bi-Motor Equipment Co., Boston, Mass.—
Salom storage batteries, Niagara lamps,
etc.
Booth Demountable Rim Co., Detroit,
Mich.—Demountable rims.
Borne-Scrymser Co., Boston, Mass.—Colo-
nial and Silex lubricants.
Boston Safety Crank Co., Boston, Mass.—
Safety starting cranks.
Boston Tire and Rubber Co., Boston, Mass.
—Tires.
Boston Auto Gauge Co., Boston, Mass.—
Tire gauges.
Bowser & Co., Inc., S. F., Fort Wayne, Ind.
—Oil and gasoline storage apparatus.
Boyd, F. Shirley, Boston, Mass.—Dixie
horns, Hawthorn pumps, etc.
Boyd Motor Co., Boston, Mass.—Minneap-
olis motorcycles.

Cook's Sons, Adam, Boston, Mass.—Lubri-
cants.
Connecticut Telephone and Electric Co.,
Meriden, Conn.—Shock absorbers and
ignition devices.
Columbia Lubricants Co. of New York,
New York City—Monogram lubricants.
Columbia Tire and Top Co., Boston, Mass.
—Tires and tops.
Coward Auto Supply Co., Bos-
ton, Mass.—Supplies and acces-
sories.
Cox Brass Manufacturing Co.,
Albany, N. Y.—Engine start-
ers, windshields and bump-
ers.
C. R. G. Manufacturing Co., Sau-
gus, Mass.—C. R. G. carburet-
ters.
Cramp & Sons Ship and En-
gine Building Co., Wm., Phila-
delphia, Pa.—Bronze and bear-
ing metals.

Dixon Crucible Co., Jos., Jersey City, N. J.
—Griphite lubricants.
Dover Stamping and Mfg. Co., Cambridge,
Mass.—Drip pans, funnels and meas-
ures.
Dorian Remountable Rim Co., New York
City—Dorian remountable rims.
Downing, C. J., New York City—Tires and
supplies.



MECHANICS' BUILDING, IN WHICH THE BOSTON SHOW WILL BE STAGED

Bucklin & Co., Walter S., Boston, Mass.—
Insurance.
Burn-Boston Battery Mfg. Co., Boston,
Mass.—Sealed liquid batteries.
Cavanaugh Bros., Roxbury, Mass.—
Century Tire Co., Boston, Mass.—Tires.
Chandler & Farquhar Co., Boston, Mass.—
Machinery, tools and machinists' sup-
plies.
Champion Ignition Co., Flint, Mich.—A-C
coils, timers and spark plugs.
Clark Foundry Co., Rumford, Me.—Cast-
ings.
Clayton Air Compressor Works, Boston,
Mass.—Garage and portable tire pumps.
Coe Wrench Co., Worcester, Mass.—
Wrenches.

Crane & Co., L. M., Boston, Mass.—Lubri-
cants.
Crowell Chemical Co., Beverley, Mass.—
Oxford polishes.
Dean Electric Co., Elyria, O.—Tuto horns
and Dynalux lighting systems.
Deane Steam Pump Co., Holyoke, Mass.—
Steam pumps.
Daniels, Smalley, Boston, Mass.—Accesso-
ries.
Detroit Electric Appliance Co., Detroit,
Mich.—Deaco ignition and lighting sys-
tem.
Detroit Tool Sales Co., Boston, Mass.—
Tools.
Diamond Rubber Co., Akron, O.—Diamond
tires.

Eagle Oil and Supply Co., Boston, Mass.—
Lubricants.
Edison Storage Battery Co., West Orange,
N. J.—Storage batteries.
Electric Storage Battery Co., Philadelphia,
Pa.—Storage batteries.
Empire Tire and Windshield Co., Boston,
Mass.—Tires and windshields.
Empire Tire Co., Trenton, N. J.—Empire
tires.
Endurance Tire and Rubber Co., New York
City—Tires.
Esterline Co., Lafayette, Ind.—Matchless
electric lighting and ignition systems.
Fairbanks Co., Boston, Mass.—Machine
tools.
Federal Rubber Mfg. Co., Milwaukee, Wis.
—Federal tires.

- Firestone Tire and Rubber Co., Akron, O.—Firestone tires.
- Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.
- Flentje, Ernst, Cambridge, Mass.—Hydraulic recoil preventers.
- Forbes, Walter J., Boston, Mass.—K-W ignition and lighting specialties.
- Frontier Iron Works, Buffalo, N. Y.—Power tools.
- Furbush, A. J., Brighton, Mass.—
- Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.
- G. C. A. Mfg. Co., Pittsfield, Mass.—
- Gibney & Bro., James L., Philadelphia, Pa.—Solid tires and vulcanizers.
- Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
- Goodyear Tire and Rubber Co., Akron, O.—Goodyear tires.
- Gray & Davis, Amesbury, Mass.—Lamps and electric lighting systems.
- Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford auto-jacks and engine starters.
- Haws, Geo. A., New York City—Panhard lubricants.
- Harris Oil Co., A. W., Providence, R. I.—Lubricants.
- Havoline Oil Co., Boston, Mass.—Havoline lubricants.
- Heinze Electric Co., Lowell, Mass.—Ignition and lighting specialties.
- Henley-Kimball Co., Boston, Mass.—
- Hillman Auto Supply Mfg. Co., Boston, Mass.—Brass and plated specialties.
- Hoffecker Co., Boston, Mass.—Speedometers.
- Holt & Beebe Co., Boston, Mass.—Lamps and electric specialties.
- Holtzer-Cabot Electric Co., Brookline, Mass.—Lighting systems.
- Hollingshead Co., R. M., Camden, N. J.—Lubricants and polishes.
- Hopewell Bros., Newton, Mass.—Tool bags, tire covers, etc.
- Hub Cycle Co., Boston, Mass.—Bicycles, bicycle and automobile sundries.
- International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.
- International Automobile Association, Boston, Mass.—Publications.
- International Metal Polish Co., Indianapolis, Ind.—Blue Ribbon polishes.
- Jackson & Co., Boston, Mass.—Motor apparel.
- Jones Speedometer, New York City—Speedometers and odometers.
- Kelleher, J. J., Boston, Mass.—
- Kellom & Co., Charles F., Boston, Mass.—Invader lubricants.
- Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.
- Keystone Lubricating Co., Philadelphia, Pa.—Keystone lubricants.
- Knight, Margaret E., Framingham, Mass.—Motors.
- Knowles, C. S., Boston, Mass.—Hartford tire pumps.
- Lawrence & Stanley, Boston, Mass.—
- Leather Tire Goods Co., Niagara Falls, N. Y.—Adjustable tire treads and non-skid bands.
- Lee Tire and Rubber Co., Conshohocken, Pa.—Tires.
- Leland & Co., W. H., Worcester, Mass.—Machinery.
- Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns and Raiswell jacks.
- Lunt, Moss Co., Boston, Mass.—Stationary pumping and lighting plants.
- Malley, Chas. A., Brighton, Mass.—
- Marburg Bros., Inc., New York City—Mea magnetos.
- Michelin Tire Co., Milltown, N. J.—Michelin tires.
- Millbury Steel Foundry Co., Millbury, Mass.—Castings.
- Miller, Charles E., New York City—Pan-American oils, Brampton chains and gears and supplies.
- Modern Auto Appliance Co., Chatham, N. Y.—Anti-skid chains.
- Moore, Smith Co., Boston, Mass.—Fur garments.
- Morrison-Ricker Co., Grinnell, Ia.—Grinnell gloves.
- Morse, John Lewis, Franklin, Mass.—Brown's Perfection inner tubes.
- Mossberg, Frank, Attleboro, Mass.—Mossberg wrenches and bells.
- Mosler & Co., A. R., New York City—Spit-Fire spark plugs.
- Motor Accessories, Inc., Boston, Mass.—Accessories.
- Motor Specialties Co., Waltham, Mass.—Bi-Plex pumps.
- Motor Vehicle Publishing Co., New York City—Publications.
- Motor World Publishing Co., New York City—The Motor World.
- Motz Tire and Rubber Co., Akron, Ohio—Motz tires.
- Narragansett Chemical Co., Providence, R. I.—Meteor lubricants and storage batteries.
- National Carbon Co., Cleveland, Ohio—Dry cells.
- National Coil Co., Lansing, Mich.—Ignition devices.
- National Pump Co., Dayton, Ohio—Pumps.
- National Rubber Co., St. Louis, Mo.—Rubber preservatives.
- National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
- New England Casualty Co., Boston, Mass.—Insurance.
- New York and New Jersey Lubricants Co., New York City—Columbia lubricants.
- Norton Co., Worcester, Mass.—Corundum wheels.
- Nugget Polish Co. of New York, Ltd., New York City—Nugget polishes.
- Pantasote Co., New York City—Top materials.
- Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania and Polack tires.
- Piel Co., G., Long Island City, N. Y.—Long horns and muffler cutouts.
- Pittsfield Spark Coil Co., Dalton, Mass.—
- Pittsfield spark coils, magnetos and other ignition devices.
- Post & Lester Co., Boston, Mass.—Stewart speedometers, Victor gas tanks, windshields, lamps, etc.
- Pyrene Co. of New England, Boston, Mass.—Fire extinguishers.
- Randall-Faichney Co., Boston, Mass.—Jericho exhaust horns, B-Line grease guns, etc.
- Raymond Engineering Co., Inc., Boston, Mass.—
- Reliance Speedometer Co., Boston, Mass.—Speedometers.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting devices.
- Republic Rubber Co., Youngstown, Ohio—Republic tires.
- Robinson & Son Co., Wm. C., Baltimore, Md.—Lubricants.
- Rogers, Milton C., Boston, Mass.—
- Rome Soap Mfg. Co., Rome, N. Y.—Soaps.
- Rose, P. R., Boston, Mass.—
- Russell & Co., T. F., Boston, Mass.—Accessories.
- Salman, John A., Boston, Mass.—Monograms.
- Sawyer Oil Co., Howard B., Boston, Mass.—Lubricants.
- Shannon, T. R., Hartford, Conn.—Polishes.
- Shaler Co., C. A., Waupum, Wis.—Vulcanizers.
- Shawmut Tire Co., Boston, Mass.—Shawmut tires.
- S. K. F. Ball Bearing Co., New York City—Ball bearings.
- Sheldon Axle Co., Wilkes-Barre, Pa.—Sheldon axles.
- Splitdorf, C. F., New York City—Magnetos and spark plugs.
- Standard Auto Supply Co., Boston, Mass.—Supplies and accessories.
- Standard Oil Co. of N. Y., New York City—Lubricants.
- Standard Tire Protector Co., Akron, Ohio—Tire protectors.
- Standard Tire and Rubber Co., Boston, Mass.—Imperial tires.
- Standard Wrench and Tool Co., Providence, R. I.—Wrenches and tools.
- Stevens, W. H., Boston, Mass.—
- Stewart & Clark Mfg. Co., Boston, Mass.—Stewart speedometers.
- Stover-Lang Co., Boston, Mass.—Speed and mileage meters.
- Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetors.
- Swinehart Tire and Rubber Co., Akron, O.—Swinehart tires.
- Texas Co., New York City—Lubricants.
- Tohey, Wm. L., East Boston, Mass.—Q. D. rim removers.
- Townsend & Co., S. F., Orange, N. J.—
- Tudor, John W., Boston, Mass.—Engine starters.
- Underhay Oil Co., Boston, Mass.—Lubricants.
- United Rim Co., Akron, Ohio—Demountable rims.
- U. S. Light & Heating Co., New York City—Storage batteries.

U. S. Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.

Vacuum Oil Co., Boston, Mass.—Lubricants.

Valentine & Co., New York City—Paints and varnishes.

Valvoline Oil Co., Edgewater, N. J.—Lubricants.

Veeder Mfg. Co., Hartford, Conn.—Speedometers, odometers, die castings, etc.

Vesta Accumulator Co., Chicago, Ill.—Lamps and storage batteries.

Voorhees Rubber Mfg. Co.—Rubber hose and packing.

Waltham Watch Co., Boston, Mass.—Clocks.

Ward & Sons, Edgar T., Boston, Mass.—Tubing and tools.

Warner Instrument Co., Beloit, Wis.—Warner autometers.

Wayne Oil Tank and Pump Co., Ft. Wayne, Ind.—Oil and gasoline storage apparatus.

Weed Chain Tire Grip Co., New York City—Anti-skid chains.

White & Bagley Co., Worcester, Mass.—Oilzium lubricants.

Wolverine Lubricants Co., New York City—Lubricants.

Missouri's Insurance Order Is Modified.

When State Superintendent of Insurance Frank Blake issued his dictum to the insurance companies doing business in the State of Missouri, forbidding them to write motorists' liability insurance, he did not foresee the storm of protest that would follow his ruling. That the protest was effective enough to make Mr. Blake change his mind is best shown by the modified order which he issued last week. According to the new rule, the prohibition extends only to the insurance of reckless owners, or owners who employ reckless drivers; immoderate use of intoxicating liquors shall be considered prima facie evidence of recklessness. Only State licensed cars are to be insured, and if a license is revoked by the State the insurance policy will be canceled immediately. New owners may insure their cars pending issuance of licenses.

London Forbids the Muffler Cut-out.

London, long suffering, finally has turned and forbidden the use of muffler cut-outs. The ordinance, which goes into effect March 31st, next, provides that drivers of motor cars "shall not use any cut-out, fitting, or other apparatus or device which will allow the exhaust-gases from the engine of the motor car to escape into the atmosphere without first passing through a silencer, expansion-chamber, or other contrivance, suitable and sufficient for reducing as far as may reasonably be practicable the noise which would otherwise be caused by the escape of the said gases." Strangely enough, the ordinance exempts motorcycles, which are notorious noise makers.

PORTO RICO "AUTOMOBILE HUNGRY"

So Declares Tire Man Who Just Has Returned—Happy Conditions That Prevail on the Island.

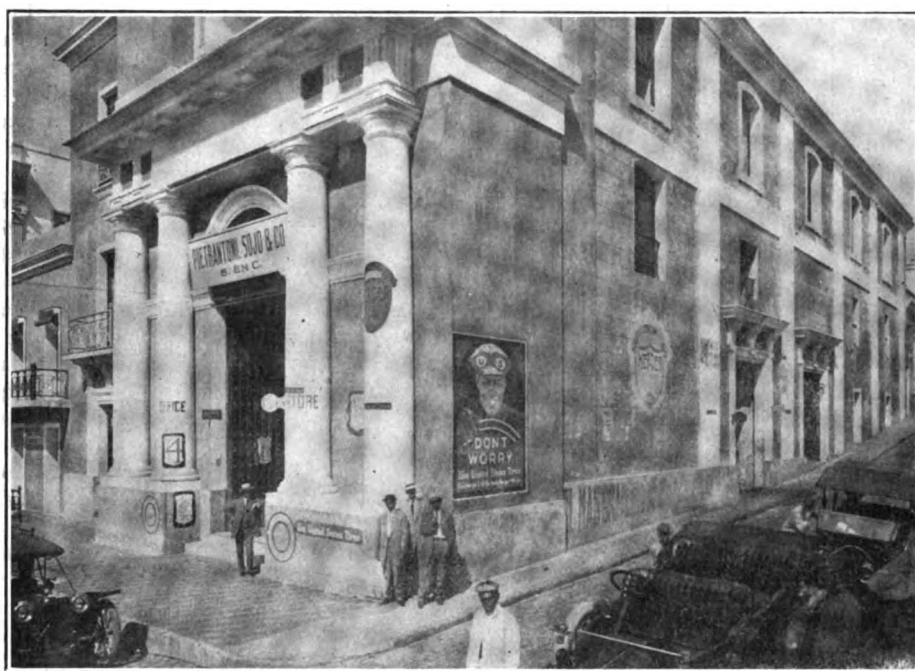
After a month spent in Porto Rico, John B. Tower, manager of the export department of the United States Tire Co., has returned to New York convinced that the island is literally "automobile hungry."

"Every ship bound for Porto Rico," he says, "has from two to half a dozen American cars aboard, and yet the islanders do not seem to get them fast enough. During the past four months 154 new machines

guesi, Aguadilla, Arecibo and Humacao, arranging for the distribution of United States tires, and established excellent connections. San Juan will be the principal distributing point, but they will be handled in each of the other places. The San Juan stock, from which the island will be supplied, will be carried by Pietrantonio, Sojo & Co., whose store and garage, here illustrated, Tower says is as completely equipped as any similar establishment in the United States. It has floor space for 75 cars.

American Trucks for Chinese Hospital.

When the management of the Christian college and hospital at Canton, China, which almost constantly is being added to, recently found itself confronted with the



SAN JUAN'S UP-TO-DATE SALESROOM AND GARAGE

have been purchased by residents of the "Second Pearl of the Antilles."

"There are at the present time 726 cars owned in Porto Rico, and as the population of 118,000 is divided into two classes, the very rich and the very poor, the island is proving a fine market for good cars. The rich can afford to buy them and the poor can't, so price isn't much of an object. Practically all of the cars one sees are American made. It is an ideal spot for touring, too. The old Spanish military roads are excellent, and while there are few of them the principal towns and points of interest are easily accessible, and the climate is such that the cars are in commission all the time.

"Motor trucks are rapidly coming into favor. There are at the present time 25 of them in use—all American made. They are owned for the most part by big plantations and are used in transporting native products from the interior to seaport towns."

Tower visited San Juan, Ponce, Maya-

necessity of modernizing its method of carrying rocks, gravel, stones and other building materials from the river's edge up a two per cent. grade to the college grounds, it instinctively turned to the narrow-gauge railroad as the only solution of its difficulty. But a closer investigation showed that conditions were rather unfavorable to the economical instalment of a complete railway system, and Dr. A. H. Woods, who for many years has been connected with the college as an instructor but who at present is practising in New York City, was requested by the college authorities to give his opinion as to the availability of motor trucks for this work. Dr. Woods, himself an ardent motorist, believes that a two-ton truck of the gasoline variety would accomplish the work better than anything else, and reported accordingly, and as a result he has been authorized by the college to arrange for the purchase of one truck, which probably will be followed by others, if the work of the sample vehicle proves satisfactory.

WHACKED PATENTED TAIL-LIGHTS

Senator's Little Bill for Red, White and Green Signals Hard Hit at Hearing—Senator is Amazed!

Intentionally or otherwise Senator Stillwell, who represents Westchester County in the New York Legislature, is the best friend that those struggling inventors possessed of patented tail lights ever had. The "good senator" became interested in such inventions last year—the kind akin to those used on railroads and that show red, white and green lights and are supposed to indicate when an automobile is about to slow up or change direction. He was so convinced of their necessity that he introduced an amendment to the Highway Law seeking to compel their use, but the "watch-dogs" of the New York State Automobile Association scented the mouse and killed it in committee.

Nothing daunted, Senator Stillwell this year reintroduced his measure, but instead of tacking it onto the Highway Law or the Motor Vehicle Law he offered it as an amendment to the Penal Code, where it was less likely to attract the notice of automobilists. However, the automobile "watch-dogs" again sensed the "animal," but when they applied for a hearing it was refused and the bill was advanced to third reading before the motoring interests were permitted to be heard in protest.

This protest was voiced at Albany on Tuesday last, 27th inst., before the Senate Codes Committee, of which Stillwell himself is chairman. Counselor Charles Thaddeus Terry was the chief speaker and he did not mince words.

Mr. Terry insisted that some one interested in the bill knew all about this private patent.

"Have you any evidence to back up that statement?" asked Senator Loomis.

"Only the character of evidence that has often convicted a man of murder, circumstantial evidence," replied Mr. Terry.

Senator Stillwell was more or less profoundly surprised—not merely surprised but indignant. He declared that Terry's statements and inferences were unfounded and that there were a half dozen appliances already on the market which would permit compliance with the provisions of his bill.

Mr. Terry retorted that there was no demand for such legislation; that it would put an unnecessary expense on automobilists, without reducing the number of rear-end accidents.

Melvin T. Berder, counsel of the New York State Automobile Association, and J. A. Ritchie, secretary; Bert Van Tuyl, secretary of the Automobile Club of Rochester; F. H. Elliott, secretary of the Touring Club of America, and Charles A. Stewart, general manager of the Licensed

Automobile Dealers of New York City, also opposed the bill.

Suggestively enough, Richard Hunt, a representative of the Chauffeurs' Union of New York, was the only one to speak in favor of the bill.

Maryland Moves Toward Real Reciprocity.

The lower house of the New Jersey Legislature having once more adopted a 15-day reciprocity bill, which stands more chance of passage in the senate now that the Honorable "Joe" Frelinghuysen is no longer a member of that body, the State of Maryland, which, while more liberal than New Jersey, still hedges its brand of reciprocity with inconvenient restrictions, has seen the light and is in a fair way of being thrown wide open to non-resident automobilists. At any rate, a bill with this in view has been introduced in the Maryland Legislature by Senator Goslin, and probably will be enacted. At present Maryland permits non-residents to remain in the State for two periods of seven consecutive days in each year, but requires that they obtain a non-resident identification plate, which, however, is furnished without charge. In lieu thereof, Senator Goslin's bill will allow all comers to enter the State at will and remain as long as they choose, provided only that the States of such non-residents extend similar rights to Marylanders. The Goslin bill also changes the present licensing system by providing a basis of 75 cents per horsepower. Also it strikes at noise makers by prohibiting the use of muffler cut-outs, and requires that warning signals be sounded only in case of actual danger.

To Curb the Municipal Joy-Rider.

With the intention of curbing the ever-present tendency of city officials to indulge in joy-riding in city-owned automobiles, the New York Board of Aldermen on Tuesday last, 27th inst., passed a resolution requiring that all city-owned automobiles must bear the words "City of New York," painted in letters at least five inches high on the back of each car. The color must contrast with the color of the body of the car, and a penalty of \$10 is prescribed for any infringement of this ordinance. Cars belonging to the Police Department are exempted from the regulation.

Ralph Mulford Joins the Free-Lances.

Following the announcement of the Lozier Motor Co.'s withdrawal from all road racing, Ralph Mulford, long the bright particular star of the Lozier team, has joined the ranks of the free-lances, to which Burman, De Palma and Joe Matson have preceded him. He has purchased a six-cylinder, 60-horsepower Knox, with which he intends to compete in the 500-mile International Sweepstakes at Indianapolis on Decoration Day, and in the national road races at Elgin, Philadelphia and in the Grand Prize.

BASYE FIRST IN BAKERSFIELD RACE

Stutz Pilot Romps Almost Alone Over 212-Mile Course—Second Man More Than an Hour Behind.

California, as usual, staged the first big road race of the year—the annual Bakersfield race, promoted by the Kern County Automobile Association. It was held on Washington's Birthday, 22d inst., over a 212-mile course out of Bakersfield, through the adjacent oil fields, in a circuitous path which led it back to the starting point. Jack Basye won it, driving a Stutz car, and though the average speed he made—36.89 miles an hour—is slow, and cannot compare with Herrick's rate of 52.33 miles an hour when he won last year's race with a National on the Fourth of July, conditions were so different as to make a comparison well-nigh impossible.

The course is a rugged, soul-trying one, and this year the distance was increased from 156 miles to 212, which accounts in a measure for Basye's comparatively slow time. His total elapsed time was 5:44:59. The second man in was Phil. Klipstein, at the wheel of a Mitchell, but he was more than an hour behind Basye, his total time being 7:05:25, and consequently his average speed was at the rate of almost exactly 30 miles an hour. P. D. Gooch-nauer, who finished third with a Buick, required 7:08:49 to cover the required distance, and his average, therefore, was even less than was Klipstein's.

The remainder of the entry list included Jack Madux, Pope-Hartford; C. R. Klein, Flanders; C. Hollenbeck, Buick; George B. Last, Buick; Glen J. Packer, National; T. W. Marsh, Reo; C. Lyman, Ford; W. Robb, Buick; S. S. Weaver, Kline; W. M. Moore, Knox, and R. Ruckstell, Stutz.

Massachusetts May Raise Registration Fees.

Following on the heels of a regiment of bills dealing with automobiles which has been introduced in the Massachusetts Legislature, as told in the Motor World of February 8th, the Governor of the State has felt it necessary to send a special message to the Legislature, advocating the increase of registration fees for automobiles from the present average of 38 cent per horsepower to not less than 80 cents nor more than \$1 per horsepower. The message dealt with the appropriation of \$262,750 for the maintenance of the Highway Commission, and with the request for \$5,000,000 to be spent in the next five years in building new highways, which leads the Governor to believe that automobilists should foot the bill.

In France, liners for insertion between the inner tube and outer casing of a tire are termed "corsets."

GEAR THAT GIVES ALL DIRECT DRIVE

McBrair Invention Eliminates Spur Gears and Generally "Looks Good"—Demonstration That Bore Out Looks.

Though there have been numerous attempts to eliminate the familiar spur gear change speed mechanism, and there are several excellent mechanisms on the market in which the desired result is obtained, there are few that hold greater promise than one which recently has been patented by Dr. Henry C. McBrair, who is a Paterson (N. J.) dentist, and for whom the new mechanism is named. The patent rights

mechanism differs from others of its general kind in that it eliminates entirely the necessity for spur gears and permits of what is generally considered to be a direct drive for three forward speeds and also for reverse. The desirable feature of a multiple number of positive gear-drives thus is obtained with the added advantage that for any of the drives but one pair of gears is in mesh, neglecting, of course, the pinions in the differential mechanism, which are necessary in any case.

In eliminating the usual gear box, McBrair has enclosed the whole mechanism in the rear axle housing, and as may be seen by the accompanying illustrations, it consists essentially of a nest of bevel gears, one for each of the three speeds forward and

mounted on a transverse square shaft and are shifted into engagement with their respective bevel pinions by means of ring cams which are suitably connected with the hand gear shift lever in a manner not unlike that used in the orthodox selectively operated change speed mechanism; the control is selective. The operation of the ring cam for any of the bevel wheels is such that when it is rotated by means of the hand lever the wheel is pushed over toward the bevel pinion until the teeth engage. Though the action of the gears thus is on the clash principle, and it might easily be supposed that considerable noise would result from an effort to change gears with the car in motion, such is not the case, the reason being, it is explained by the inventor, that the gears tend to roll together rather than to clash.

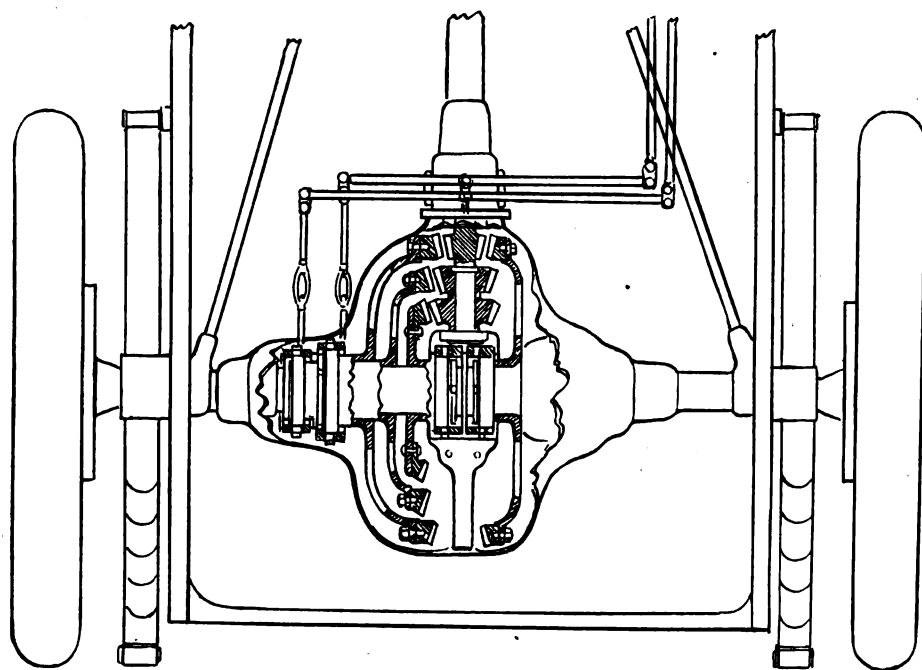
One of the interesting points of the mechanism is that even for reverse motion there is but one pair of gears in mesh. This effect is obtained by using a separate bevel wheel for reverse. It is mounted opposite to the low speed bevel wheel, facing it, and is meshed with the same bevel pinion that serves for low speed ahead.

The weight of the mechanism is less than the combined weight of an ordinary four-speed change gear mechanism and a separate bevel drive and differential, comparison being made with the increasingly popular four-speed mechanism instead of a three-speed mechanism, though the McBrair system provides only three speeds ahead, for the reason that it really provides the equivalent of four speeds because of its greater efficiency and decreased loss of power in transmission.

The action of the McBrair mechanism is particularly sweet, a ride in a Stoddard-Dayton car equipped with it serving to certify all of the broad claims which the inventor makes for it. For the benefit of a Motor World man, the car was driven at speeds of from five miles an hour up to 30 miles an hour through all three of the forward drives, and the most conspicuous part of the demonstration, barring the smoothness of action of the gearing, was the absence of noise and the remarkable acceleration of the car. Gears were shifted from high speed to low and back again with the car traveling at approximately 20 miles an hour, and except for the sound of the engine it was impossible to tell when they were shifted or on what gear the car was being driven.

Water Leaks That May Affect Steering.

Owing to the construction of some brands of car, a leak in some certain part of the water system may permit water to drip on the lower end of the steering column. If the temperature is below the freezing point it is not unlikely that the drippings will freeze and cause an unusual stiffness in the steering gear. Such leaks should be stopped or not only frost but rust will interfere.

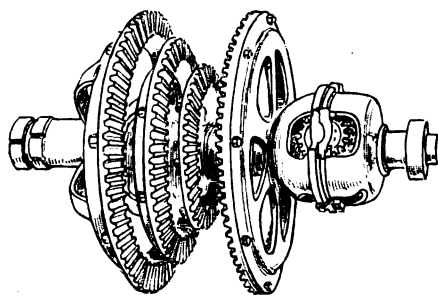


SECTIONAL VIEW OF THE McBRAIR DIRECT DRIVE SYSTEM

for it have been secured by the Direct Drive Gear Co., which was incorporated with \$500,000 capital, under New Jersey laws, some nine months ago. Recently a factory has been acquired in Paterson, where the company is preparing to manufacture the system and to fit it to cars in place of existing systems. McBrair, who also is president of both the Neversink Valley Water Co. and the Orange County Power Co., is president of the company. Associated with him are Charles D. Cooke, who is vice-president, and who formerly was secretary and treasurer of the Cooke Locomotive Works; Charles A. Isleib, treasurer, and also president of the Eureka Silk Mfg. Co. and the Eureka Realty Co.; David G. Rogers, secretary, president of the David G. Rogers Co., dealers in mill supplies; and C. E. Garrabrant, who is the general manager and who also is president of the Charles E. Garrabrant Co., dealer in fire apparatus and motor appliances.

Though the idea involved in the McBrair system is not entirely new, the

one for reverse, and three bevel pinions which are rigidly attached to the propeller shaft. It is in the operation of the gear shifting mechanism, however, that the real



THE NEST OF BEVELS

ingenuity of the inventor becomes apparent, and incidentally it was this part of the system which required the greatest amount of study and experiment before it eventually was brought to its present state of perfection.

The four bevel wheels are slidably

HOW HARTFORD'S SYSTEM OPERATES

Remarkably Small Motor That Starts the Engine or Lights the Lamps—Wiring Plan Also Quite Simple.

Supplementing preliminary meager descriptions of the latest product of the Hartford Suspension Co., of Jersey City, N. J.—a combination electric lighting and engine starting system which made its first appearance at the Madison Square Garden show in New York—additional design and constructional details are now available and serve to indicate conclusively the right of the new product to occupy space in the same plane of excellence in which the Truffault-Hartford shock absorber quite properly belongs. The new system is the invention of Edward V. Hartford, and though it is of the type in which a separate electric engine starting motor and generator are used, it differs from other such systems in the method of connecting the starter to the automobile engine, and also in that the several elements are exceptionally small and compact but well and substantially made withal, as becomes the reputation of the company's other well-known products.

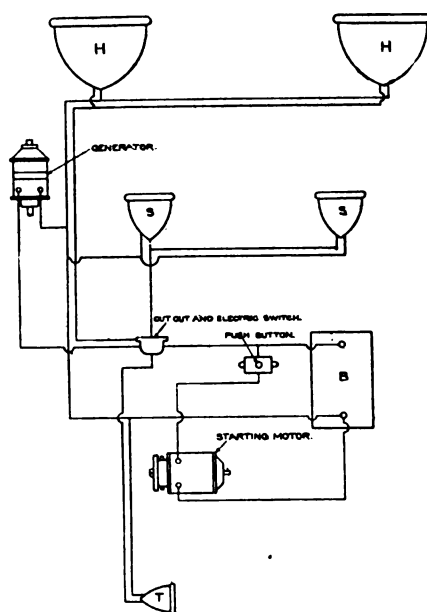
In perfecting the system the desirability of light weight has been kept in mind and to this end both the generator and the motor have been made as light as possible, consistent with the work to be performed. In this respect the unique method of connecting the engine starter and the engine contributes materially in that it permits the employment of a motor, which, to quote the description of the manufacturers, "is almost a toy." That it is a toy in appearance only—its over-all measurements are but $4\frac{1}{2} \times 7\frac{1}{2}$ inches—is attested by the fact that it "cranks" the average motor at the rate of from 40 to 60 revolutions a minute without the slightest hesitation. What is more to the point, it operates on a 12-volt circuit and consumes only 180 watts. The small amount of current which is consumed permits the use of a small button to set the starter in operation.

The connection between the electric motor and the engine is made through the intermediary of a combination worm and spur gearing, which gives a total reduction of 125 to 1. This explains, in a measure, its really tremendous power output—tremendous by comparison with the size of the motor itself—and for its instantaneous action.

Another of the contributing factors to its efficiency is the incorporation of a miniature flywheel which weighs about two pounds and in which is stored sufficient energy to permit the motor to operate at the same speed during compression strokes of the engine, when the greatest amount of work is being performed. The electric

motor drives through the timing gear train, an additional spur gear being used for this purpose. It is this spur gear which in turn is driven by the worm gearing. Immediately the engine starts, a clutch positively and automatically disconnects the motor and the engine and the electric motor remains idle.

In order to eliminate the possibility of back kicks damaging the mechanism, a friction device similar to that which is used in the Truffault-Hartford shock absorbers, and consisting of two disks held together by means of a spider spring, is employed. The worm gear, instead of being keyed to its shaft, is held in place by the friction clutch, which is so adjusted that the friction is just sufficient to transmit the power of the electric motor in starting the engine. Back



HARTFORD WIRING PLAN

kicks, therefore, simply cause the shaft to slip, and do no harm.

The generator which is used in charging the storage battery, from which current for the lights and to operate the engine starter is drawn, is scarcely any larger than the motor, and may be arranged in any convenient location where a suitable drive can be obtained. A combination magnetic cut-out and lighting switch, located on the dash, serves to disconnect the generator from the battery when the car speed falls below 10 miles an hour. Owing to the fact that the generator is direct connected to the engine, there being no necessity for a clutch or other speed governing device because of the winding—which is such that the excess current at high speeds automatically is choked off by electrical means—there is nothing to get out of order, and the whole system should operate for indefinite periods without attention beyond an occasional replenishment of the electrolyte in the battery. The system is supplied in two forms, either as a combination engine starting and lighting unit, or

as a simple lighting unit alone, the latter differing from the more complete system only in that the engine starting motor is omitted. The wiring is quite simple in either case, the wiring plan of the combination system being shown herewith:

Not Six, But Fifty-six, at Binghamton.

Due to several unusual circumstances, the Motor World was made to say last week that six automobile dealers constituted the third annual Binghamton (N. Y.) show, which opened February 20 and closed five days later, when as a matter of fact 56 exhibitors were housed in the State Armory which contained the show. They displayed a total of 80 pleasure cars, 12 trucks and 21 motorcycles, in the eye-pleasing decorative setting that prevailed, and that the Binghamton public was interested and responsive was demonstrated by the attendance, which broke all previous records. The full list of those who exhibited is as follows:

Automobiles: Lowell, Hammond & Worden, E-M-F, Pullman, Marmon and Flanders, Westcott, Winton and Stearns; H. W. Brown, Buick, Thomas and Pope-Hortford; Broome County Motor Car Co., American; New York Sales Co., Cole, Rambler, Hudson and Paige-Detroit; R. W. Whipple, Packard cars and trucks; Binghamton Cadillac Co., Cadillac; F. W. Van Antwerp, Everitt; W. F. Edwards, Corbin; June Automobile Co., Chalmers, Mitchell and Brush; Davidge Motor Car Co., Pierce-Arrow; Palmer-Singer Distr. Co., Palmer-Singer; S. H. Lewis, Columbia, Franklin and Maxwell; Purdy & Mix, Fiat and Hupmobile; Lewis & Niblette, Reo and Martin trucks; Ford Motor Sales Co., Ford cars and delivery wagons; Abbott-Detroit Motor Sales Co., Abbott-Detroit; McKinney & Co., White trucks; Prentice & Hoadley, Metz cars; Chase & Sampson, trucks; H. H. Young, Imperial; Frank S. Bump Co., R. C. H. cars and Universal trucks; George S. Storrs, International auto delivery wagons; Oakland Motor Sales Co., Oakland; G. W. Barton, Elmore.

Motorcycles: Waldron Drug Co., Iver Johnson; Norval S. Douglas, Thor; B. E. Jewell, Excelsior; Campbell & Morton Mfg. Co., Flanders; F. Ellis, Marvel; Turner's Bicycle Store, Harley-Davidson; C. H. Wakeman, Curtiss; W. H. Bunnell, Reliance.

Accessories: R. G. Hollingshead, Whiz specialties; A. L. Davis's Son, tops; Dayton Airless Tire Agency, tires; Frank S. Bump Co., supplies; R. W. Whipple, supplies; 1900 Washer Co., washers; N. H. Snow, tops and other accessories; W. G. & S. Lichtenstein, auto clothing; Berry's Drug Store, soaps and polishes; F. G. Townsend, 20th Century Tire Protectors; Wayne Oil Tank & Pump Co., storage tanks; Standard Oil Co., oils and greases; F. J. Mason, Magic vacuum cleaners; Tiona Oil Co., oils and greases; Winans Machine Co., vacuum cleaners; Myers Brothers, ivory novelties.

TRANSMITTING THE DRIVE THROUGH THE SPRINGS

Feature of Automobile Construction That Often Perplexes Those Who Consider Springs Merely as Shock Absorbing Devices—How They Push the Car Forward and the Principles Involved—The Two Systems Followed by Automobile Manufacturers.

Due to the fact that in every-day language the three terms: "force," "energy" and "power" are used indiscriminately to express substantially the same thing, there exists no little confusion of ideas in regard to the exact nature of these mechanical actions. For instance, there is the common enough expression in automobile parlance, "to transmit the power through the springs," meaning that the suspension springs perform the functions also of radius members and thus take the drive. Because the average car owner rarely views the spring in the light of a power transmitter, the phrase may not convey its real meaning and often tends to confuse the lay mind, and might be better expressed; it, nevertheless, is correct in the concrete, as a little side excursion into the realms of elementary mechanics quickly demonstrates.

In the first place, energy is indestructible; if it is expended in work it is not destroyed, though part of it may be rendered useless. Thus, a moving automobile coming to rest transfers its kinetic energy into other kinetic energy, represented by the useless heat generated in the brakes and tires through the friction, and, though none of the heat is destroyed, it is dissipated into the earth and the air in such manner as to be beyond recovery. Potential energy is simply possible energy, or stored energy. In the case of a steam engine it is represented by the pressure in the boiler, and in the case of an internal-combustion engine by the possible pressure obtainable in the cylinders.

The rate at which any given prime mover can perform work is called its power, but unless it is working it can deliver no power, regardless of the amount of potential or kinetic energy it may have. A machine standing still is not supposed to be working any more than is a post or a rope when sustaining a heavy load; it may be sustaining an oppressive burden, but the necessary force moves nothing and therefore it cannot be styled power. If the rope were cut or the post removed after the weight first had been properly harnessed by means of levers so that the potential energy stored in lifting it to its position was expended in work, power would result. In other words, power is potential energy converted into work, preferably, and for the case in point, useful work.

Strictly speaking, there is no potential energy in an internal combustion engine

until the explosive charges are fired in its cylinders, and when they are fired the potential energy immediately becomes power for the reason that it is expended in work—the work of overcoming the friction in its journals and bearings. Because it cannot develop power until it is running, or, in other words, it cannot start itself under a load, it is necessary that there be some means of disconnecting it from the road wheels in order to permit it to be developing sufficient power (or, rather, to store up potential energy) when it is desired to put it to work. For this reason a clutch is used.

It may be assumed, therefore, that when an internal combustion engine is running idle it represents potential energy and not power. In order to convert the potential energy into power it is necessary to cause it to perform work—neglecting, of course, the work which is performed in overcoming the friction of its own bearings, etc., and referring only to useful work. As the useful work of an automobile engine consists in propelling the automobile, it follows that there must be some means of diverting this work to the proper ends. For this purpose the transmission system is used.

If both rear wheels of an automobile were jacked up and rotated by the engine, the action still might be styled potential energy, though a certain amount of work is performed in turning the wheels. Immediately the wheels are let down into contact with the road, however, the work becomes useful work, the power developed by the engine being transmitted to the road wheels and back to the chassis through the transmission system. At the instant of contact or, supposing the wheels to be on the road, at the instant the engine is started—neglecting the clutch, and supposing the engine to be direct connected, for convenience—there results force which is the cause of change of motion.

According to Sir Isaac Newton's third law of motion, "to every action there is always an equal and contrary reaction." Applying this law to the automobile, it becomes apparent that the action of the engine in rotating the wheels must have an equal and contrary reaction and it is the reaction which propels the vehicle. That is to say, the force between the road and the wheels must be equal. The power transmitted from the engine tends to push the vehicle ahead—or backward, as the case may be—but the static push of the road on the wheels must be equal if the car is to

move. This is proven often enough when the rear wheels encounter slippery spots and simply rotate without moving the car. In this case, there is nothing for the wheels to push against, consequently there is no static push from the road, and the car does not move.

However, the mere fact that there is a push between the wheels and the road necessitates that there be an equal push in the mechanism itself to counteract the tendency of the engine and transmission to rotate around the axles in the opposite direction in which the wheels rotate. For this purpose a torque rod or a torque tube is used; it directs the torque, or twist, of the axles, and limits it to one of two directions, according to whether the car is being driven backward or forward. Assuming an infinitely elastic torque member which could perform its functions without in any way maintaining the relationship between the rear axle and the rest of the car other than to prevent the axle from twisting in the wrong direction, and a propeller shaft which might also be extended or foreshortened, it must be apparent that immediately power was transmitted to the wheels they would tend to move without relation to the rest of the chassis. In other words, it is necessary that there be some means of transmitting the push of the road wheels, and consequently the power of the engine, to the chassis, in order that the car may be moved.

There are three ways of doing this. The first is to provide suitable radius members between the rear axle and the frame; the second is to so arrange the torque member that it performs both functions, and the third is to make the springs literally push the vehicle—in which case the springs really do transmit power, for the reason that the potential energy of the engine does not become power—that is, power put to a useful purpose—until work actually is done, and the work is done through the intermediary of the springs. The power is first transmitted to the road wheels, where it exerts a push on the road, and this push, which represents power, is transmitted back to the vehicle through the springs. A better expression than "to transmit the 'power' through the springs" is "to transmit the 'drive' through the springs," though the fact remains that the power necessary to drive the vehicle is transmitted through the springs to the car.

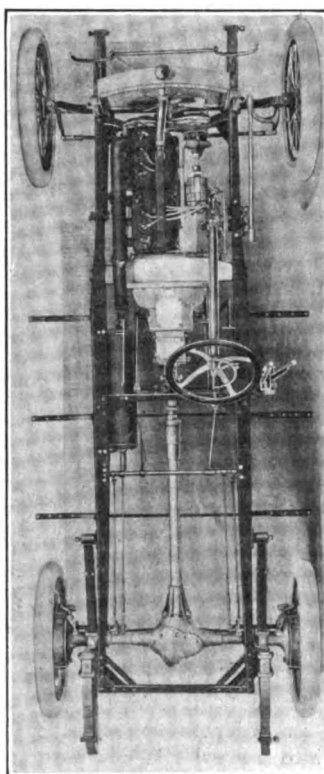
The system of driving through the springs

is not new; Renault used it in some of his very earliest machines and uses it to this day. American manufacturers have used it as well, and probably quite as long, though it is not quite certain just where it originated. Suffice it to say that it is to be found on low-priced cars, medium-priced cars and high-priced cars, and numbers among its exponents the manufacturers of such well-known products as the Lozier, the Packard, the Stevens-Duryea, the Warren, the Thomas, the Ohio and a number of others of equally wide repute. Like every other distinctive arrangement of essential elements, it has come in for its share of "knocks," and there are those who are not afraid to come out in the open and declare that it is impracticable. Nevertheless, it continues to be used and it is doubtful if there is any better recommendation of its worth than a list of the manufacturers whose products are spring-driven. Of course, the system has certain drawbacks; every system has them; but it stands to reason that its advantages must outweigh its disadvantages by considerable or it long ago would have been relegated to the scrap heap, figuratively speaking.

In examining the system it is necessary to look first into the manufacturing cost, though it should be remembered that among manufacturers of repute actual cost seldom is the determining factor in the adoption of a specific system or method in building. Nevertheless, it is an interesting fact that in driving through the springs at least one part, otherwise necessary, is eliminated. As has been stated before, when the drive is transmitted through the springs there is no necessity for other radius members, and the greater simplicity of the chassis which results may be appreciated by an examination of the accompanying illustrations. Obviously, with the elimination of other radius members the elimination of their cost also results. Also, it may be added, there is eliminated the cause of sundry rattles, for it is an unfortunate fact that few radius members are so constructed and connected to the chassis frame that they do not, after more or less service, give rise to a part, at least, of the noises which it is the earnest endeavor of every manufacturer to subdue.

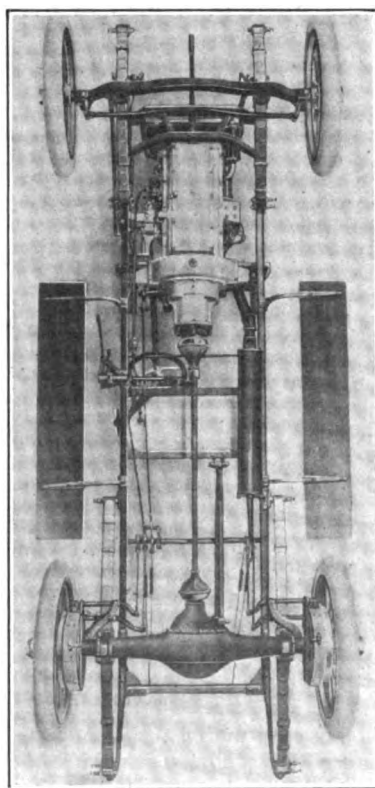
In the two chassis which are illustrated two distinctly different arrangements of transmission elements are shown and each is used to considerable extent. In the first, which is a Cole chassis viewed from above, the torsion member is in the form of a tube which encloses the propeller shaft. This torsion tube does not, however, take any of the drive, which is transmitted entirely through the springs, these being firmly fastened to the sides of the chassis frame at their forward ends. As a matter of fact, except in a very few cases in which other provisions are made, springs which transmit the drive always are rigidly fastened to the chassis frame at the forward end. It is not practicable to shackle them, unless

some other form of radius member is used, for the reason that the shackles would per-



COLE TORSION TUBE

mit sufficient movement of the rear axle to alter continually the relationship be-



OHIO TORSION RODS

tween it and the other transmission elements.

In the other arrangement, which is illus-

trative of Ohio practice, no torsion tube is used. Instead, a separate torsion rod, attached at the rear end to the differential housing and at the front end to a cross frame member, takes its place. The springs, of course, are rigidly attached at their forward ends, though, like the others, they are attached at the rear by means of shackles. This method of using a separate torsion member has been used for years, though it is only comparatively recently that the torsion tube has come into general use. With either arrangement the desired result is obtained, and as the result is the same in either case a treatment of the theory of one will suffice for both.

The exact effect which is obtained when the drive is transmitted through the springs is well illustrated in the two half chassis which are shown together. In the left-hand picture the Winton arrangement is shown, and the radius, or drive, rod is clearly visible below the spring. The front end of the spring is shackled and the shackle plate also serves to connect the radius rod to the frame. In the Warren arrangement, shown in the right-hand picture, no radius rods are used, the front ends of the springs being rigidly attached to the frame by means of pins.

One of the more important of the advantages of thus transmitting the drive through the springs is that a certain flexibility not obtainable with the radius rod drive is obtained. When the clutch suddenly is brought into engagement there is not such a sudden application of power to the rear wheels and it might naturally be inferred that for this reason tire wear would be decreased. Unfortunately, there are no data to afford enlightenment on this important point. Except for the fact that this method of construction eliminates radius rods and therefore makes for greater simplicity the element of flexibility which it gives is probably one of its greatest advantages.

There is one complication which the method of driving through the springs entails, however, though it is not necessarily entailed by this construction alone: Unless any radius member, whether it be the springs or separate rods, permits the wheels to move in a circle the radius of which is the same as the length of the propeller shaft it then becomes necessary to provide a slip joint in the propeller shaft. This is for the reason that the wheels and rear axle cannot swing on two different radii at the same time, and, as their movement is governed by the members which take the drive and not the propeller shaft, it is necessary to so construct the shaft that it will accommodate itself to the constantly varying length. Though the slip joint—which is necessary—is a complication, it is not one which need cause alarm, for it is comparatively easy to manufacture, never gives trouble and requires no attention beyond occasional lubrication.

More than once the question has been

raised as to what the result would be if one of the springs in a car which is driven through its springs should break. In the first place, the manufacture of springs has been brought to such a high state of perfection that breakage is of comparatively infrequent occurrence. It is particularly infrequent in cars which are arranged to drive through the springs for the simple reason that the factor of safety naturally is made greater to prevent it. In the event of a broken spring, however, the exact effect is problematical, though it is probable that the worst that could happen would be a straining of the remaining perfect spring and of the torsion member, which naturally would tend to maintain the relationship between the rear axle and the propeller shaft. At any rate, it has been demonstrated that a broken spring need not cripple

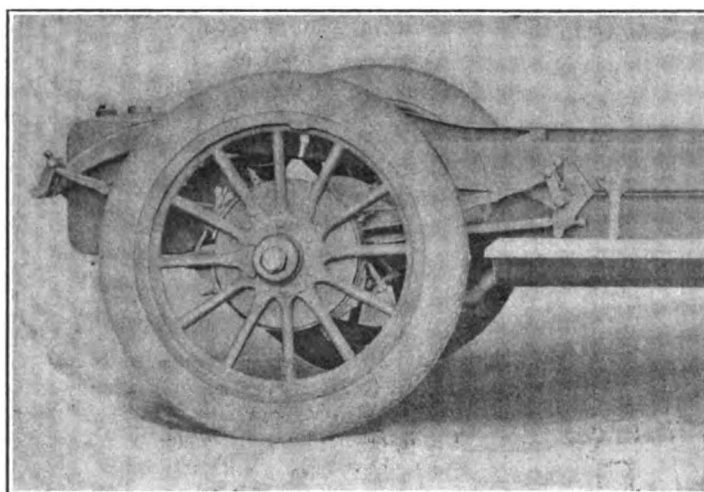
mileage per gallon of fuel was increased from 20 to 25 per cent.

Inasmuch as laudanum is merely opium dissolved in ether, and as opium in any form cannot be expected to affect the operation of such an inanimate object as an automobile engine, it is apparent that if the effect obtained was as stated, and there really is little reason to believe that it was, it can only have been due to the presence of the ether. As has been stated, the possibility of safely enriching the fuel of internal combustion engines long has been contemplated with longing, though none has successfully solved the problem in such a way as to make the solution either a commercial possibility or of such nature as to be applicable to all engines. As long ago as 1903, Le Mare, an engineer of Brussels, Belgium, even went so far as to obtain a

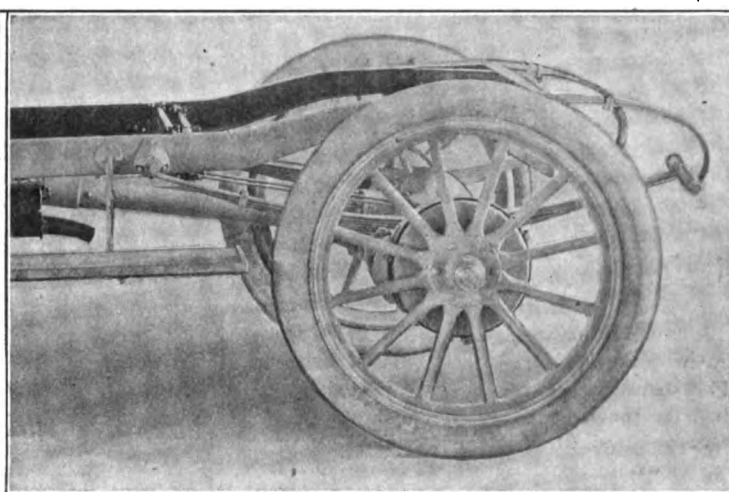
nected to binding posts of their respective colors, in order to obviate the possibility of such accidents, this scheme has not been adopted to any great extent in America, the Remy Electric Co. being one of the few that employ it. If it becomes necessary to disconnect the wiring it is well carefully to mark the terminals so that the wires may be replaced properly. When installing a new instrument great care should be taken to see that the manufacturer's instructions are followed closely.

To Prevent "Gasolene-Logged" Floats.

Cork carburetter floats, after prolonged usage, are apt to become "waterlogged" or, to use the correct though less common term, "gasolene-logged," and at such times the level of the fuel is raised and flooding results. The method universally employed



RADIUS ROD DRIVE—THE WINTON



EXAMPLE OF SPRING DRIVE—THE WARREN

ple a vehicle entirely. Cars which are driven through their springs have been operated for considerable distances with one spring broken without results which were fatal to the rest of the mechanism, though the practice is one which should be avoided except in cases of great necessity. At the least, the fact that it is possible to drive a car with one spring broken successfully lays the ghost that an accident of the kind would require that the car be towed home or that it be left in statu quo, to use a convenient Latin phrase, until a new spring could be fitted.

Laudanum as "Dope" for Gasolene.

"Doping" gasolene to obtain more power is not a phrase that is unknown—indeed it is a practice which has been attempted almost since automobiles first rolled over the roads. The climax appears to have been reached, however, in the action of the owner of a light runabout who "doped" his gasolene in the true sense of the word with no less a substance than laudanum! An ounce of the drug to five gallons of gasolene was his prescription, according to the *Scientific American*, and so efficacious did the doping prove, it is said, that the

British patent, No. 3,623, for an invention the object of which was to increase the available number of calories for a given weight of fuel. He proposed an explosive fluid mixture combining 30 per cent. of nitro-benzine with 70 per cent. of alcohol. Like all such other inventions, however, it long since disappeared and it is doubtful if there ever will be perfected anything of the kind that will be of real value.

Causes of Magneto Demagnetization.

Though the magnets of a magneto may be expected to retain their magnetism and to continue to cause a spark of normal intensity for long periods, it is quite possible with improper handling to cause them to lose their magnetism, in which case the magneto will become useless until it is re-magnetized. Sudden jars and blows will cause demagnetization and they should therefore be carefully avoided, but the greatest cause of loss of magnetism lies in the improper connection of the wires which permits the battery current to flow through the magneto windings in the wrong direction. Though it is common practice abroad for magneto manufacturers to use different colored cables to be con-

to prevent this trouble is to coat the float with shellac or some varnish unaffected by the solvent action of the fuel. A better method of treating cork floats, and one which is absolutely certain to prevent the disintegration of the cork by reason of the alternate swelling and contraction of the substance which not only cracks the varnish but opens the seams in the float, is to immerse the float for a couple of seconds in molten paraffine, and with a soft camel's hair brush dust the wax coat with very fine plumbago. Attach a piece of No. 18 bare copper wire to the metal spindle, in the case of the solid cylindrical type, or to the brass lever in other types, and place in a copper plating bath. Deposit quite a heavy coat of metal on the float, which should be turned several times during the operation to insure the uniformity of the deposit. A slight readjustment of the float, with regard to the check valve stem, will be made necessary by the added weight of the copper, which weight, however, is slight. In case it is inconvenient to attach wire to the metal parts of the float, insert a pin to carry the current. The pin can be clipped off and filed down when the operation is complete.

VANADIUM'S INFLUENCE ON STEEL

Not Merely a Flux and Cleanser, Says Expert—Forms Carbides and Increases Toughness of Steel.

Though it is only comparatively recently that the immense value of vanadium in the manufacture of steel has become known, metallurgy has been advanced appreciably within the past few years by its use and it is doubtful if there is any industry which has been benefited to a greater extent than the automobile industry. As a result, the term "vanadium steel" has become a fairly common one, though there still exists considerable misconception as to the nature of this rare metal and its effect on the steel with which it is combined.

Vanadium was discovered in the year 1830 by a Swedish chemist named Nils Gabriel Sefstrom, and is described as a "silver-white metallic element, rare, difficult of extraction and of no value by itself, though certain of its salts yield intense, permanent black colors." It is found combined with vanadinite and other rare minerals, and though the principal sources of supply are Colorado and Utah, Peru also yields small quantities and still smaller quantities come from Russia and Arizona.

The value of vanadium is due to the fact that, introduced into steel, it combines with the carbon and iron to form a permanent carbide, which not only statically strengthens the steel, but also, which is of much greater importance, intensifies and accelerates the hardening qualities to a remarkable extent. It also confers great toughness and endurance on the steel. Though for some time after the introduction of vanadium into the metallurgy of steel it was believed that its action was that of a purge, or a flux, or a scavenger of nitrogen and oxides, such is not the case, says Samuel G. Stafford, who is president of the Vulcan Crucible Steel Co.

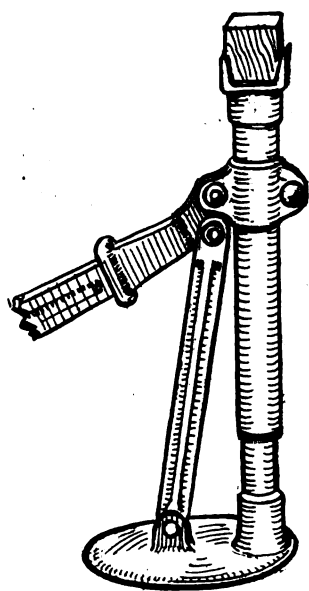
"Investigation and experiment soon disproved this idea," he says, "as it soon was found that the beneficial results obtained bore a direct relation to the amount of vanadium that remained in the steel, and that the returns were greater the less scavenging the vanadium was called upon to do. The percentage of nitrogen and oxygen in steel is a condition dependent entirely upon the melting. The higher the temperature of the molten bath, naturally, the more gases it will contain, and in order to avoid an injurious percentage of nitrogen and oxides in steel, it is necessary to control carefully the melting temperature. While poorly melted steel can be improved by sacrificing a large amount of the vanadium added, it is by no means equal to melted steel into which the greater portion of the vanadium added has remained as a constituent. With steel that has been care-

fully melted, the loss of vanadium is very slight.

"It also has been found that very much higher percentages of vanadium than originally proposed produce increased beneficial results. This has been amply demonstrated in the case of high speed tool steels where the percentage of vanadium has been generally increased from one-quarter or three-tenths of a per cent. to about one per cent.

Jack Devoid of Gears and Ratchets.

That a jack which is simple, substantial, easily worked and quick-acting is a thing to be desired, goes without saying, and the Hislop Motor Jack Co., of Sidney, Ohio, has produced a jack that seems to fill these requirements. The accompanying illustration shows the construction so



clearly that extended description is unnecessary. The parts are all of steel tubing and malleable iron, except the top pad, which is of hard wood for the protection of finished parts, such as hub caps. The jack is adjusted to the proper height to go under hub cap or axle, by means of the clamp encircling the outer tube, and the adjustment does not change until a wrench again is applied. When put in place to lift, a single movement of the lever which fits into the socket lifts the car and at the same time locks the jack, and when the lever is removed there is no danger of the jack accidentally letting down. Both locking and unlocking are entirely automatic, and the jack has an extremely small number of parts, none of which are screws, gears or ratchet devices.

Chicago Has a "Chauffeur Factory."

While many of the so-called chauffeurs' schools prefer to designate themselves "colleges," or "academies," there is one such institution in Chicago that has no use for such high-sounding terms. It frankly styles itself a "chauffeur factory."

NEW ORLEANS'S SPRINGLIKE SHOW

Clinging Vines and Potted Plants Suggest the Balmy Season—Thirty-seven Brands of Cars Displayed.

Although the low ceiling and the numerous pillars prevented the full attainment of the effect desired by the decorators, the automobile show staged in Washington Artillery Hall from Wednesday, February 21, until late last Saturday night, February 24, under the auspices of the New Orleans Automobile Dealers' Association, really presented a very creditable appearance. The pillars and the ceiling beams were covered with clinging vines, and potted plants were so numerous that the hall suggested a spring garden decorated for a gala occasion, with numerous and vari-colored flags. Illumination was not lacking, for the walls and ceiling were festooned with streamers of incandescent lamps, the light from which augmented the rays from the vine-entwined chandeliers. The exhibits were marked off by white picket fences, laden with smilax and floral decorations; neatly lettered signs enumerated the different makes of vehicles.

The 21 exhibitors of motor vehicles staged 37 different makes of pleasure and commercial cars; but four accessory dealers exhibited—however, their lines were so comprehensive that the equipment side of the show was no disappointment.

The vehicle exhibitors were:

Stauffer Eshleman & Co., Mais truck; Gulf Motor Co., De Tamble; Abbott Automobile Co., Packard and Baker electric; Crescent City Tuto Co., Thomas and Hudson; Fairchild Auto Co., Peerless, Pathfinder, Reo and Peerless truck; Corbin Motor Co., Corbin, R. C. H., and Speedwell truck; Demack Motor Co., Knox and Detroit electric; Zilberman & Fogarty, Oakland and Commerce truck; Gus D. Revel, Cadillac and Chase; Cooke Auto and Taxi Co., Locomobile; Myatt-Dicks Motor Car Co., Marmon and Stoddard-Dayton; Russell Motor Car Co., Ford; Chalmers Motor Co., Chalmers; Commercial Truck and Auto Co., Gramm and Modern trucks; Day-Rice Auto Co., Winton, Alco and Paige-Detroit; A. L. Ducote, E-M-F and Flanders; Lyons-Barton Co., Pierce-Arrow and Pierce-Arrow truck; Joseph Schwartz Co., Buick and Reliance truck; Shep D. Hogue & Son, Overland and Garford; Powell Motor Car Co., White; A. S. White, Rambler.

The accessory exhibitors were: Charles E. Miller, Pan-American oils, Brampton chains and supplies; Electrical Appliance Co., Wagner charging outfit, Miller storage batteries and accessories; Southern Hardware Co., Auto-Vulcanizer and accessories; Shuler Rubber and Supply Co., Firestone tires and accessories.

FRANCE SEES "AMERICAN SPECTER"

**Our Competition Begins to Alarm Manufacturers "Intoxicated by Success"—
Irish Critic Also Suggests Things.**

France finally has seen the "American specter" and is betraying signs of fear that the "American invasion" may become a serious menace to the French trade.

"Success intoxicated our constructors to such an extent that for the past few years it seemed only natural to them to keep the buyer waiting for a long time for delivery," remarks a Paris trade journal in dealing with the subject, "and also too often to regard the sale as a favor done to a client."

Which remark leads the Irish Motor News to moralize on causes and effects and incidentally to suggest that Ireland itself is not unlikely to become a country of American car users.

"As long as the rest of the world was busy supplying its own local demand, the point of view of the long-suffering purchasing public did not impress itself very much on the French trade," says the Motor News. "Now, however, with American cars appearing throughout the country and agency appointments being arranged for such, they have to face a serious form of competition. The American methods of push and hustle, coupled with low prices, are telling, and imported cars are taking on in France to an extent sufficient to alarm the home makers.

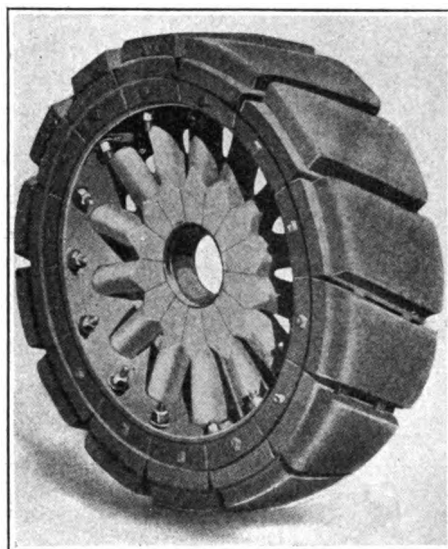
"As to how best to stem the flood of motor car invasion, our Gaelic contemporary concludes, with an injunction to local manufacturers to become cognizant, at once, with the 'fundamental principles of commerce,' and learn that in order to do business nowadays the number of traveling salesmen must be kept up to the full complement. Again, just as the ordinary bagman can do nothing without his samples, so also must the motor car salesman fare forth armed not only with attractive catalogues and illustrated literature, but also with his hand grasping a steering wheel 'with a car at the end of it.'

"From the gist of our contemporary's article it can be seen that the arguments advanced have particular application to Ireland. We are getting so accustomed to being neglected by many of the English manufacturers that there is risk of our becoming a nation of American car users. This is a matter which concerns us far less than it does the manufacturers out across the Irish Sea, quite a lot of whom seem to rest content just because they have agency agreements running in a few of our larger cities. It is a notable fact that the enterprising firms who have 'explored' Ireland by car have found it possible to 'exploit' Ireland thereby and to open up valuable markets.

"That the American car is obtaining such a vogue in the very country from which automobilism emanated is indicative surely that it is likely to seriously interfere with whatever hopes the British makers may have of securing all the business that may be offering over here."

Diagonal Block Tire for Heavy Trucks.

While the fact that the heavy motor trucking problem is largely a tire problem has found expression so often that it is positively hackneyed, it is none the less true, and it is responsible for the continued activity of tire makers in bringing out tires designed to solve this serious problem. A recently developed tire that is readily renewable in any part is the "diagonal" block tires of the Diagonal Block Tire Co., of



Urbana, Oh., which concern was organized and incorporated in Akron, O., several months ago, with a capital of \$25,000, but which recently removed to Urbana and increased its capital to \$100,000. Harrison Craig is president, S. S. Deaton vice-president, Randolph McAdams treasurer, Frank R. Talbott manager, and A. L. Siegrist sales manager.

The "diagonal" tire, which has been undergoing tests for the past year, is made up of a series of rubber sections which, as the name indicates, are applied to the rim of a steel shoe which has flanges adapted to fit across, as is usual with tires of the block type. Any one section can be removed individually without in any way disturbing the others. Each block is mounted on a steel shoe which has flanges adapted to fit over the sides of the wheel rim, preventing lateral motion; bolts of special shape securely hold the sections in place, interlocking in such a way that stresses are distributed instead of being localized in the particular block or blocks that may be under momentary pressure. A tire made up of these diagonal blocks affords a continuous support, while still allowing the rubber to be displaced so as to permit the maximum of resiliency.

LETT'S VIEWS OF AMERICAN SHOWS

**Uniform Decorations Do Not Appeal to
London Visitor—His Opinions of
Cars, Competition and Tariff.**

While the average American show exhibitor and the average show goer consider that the adoption of uniform decorative schemes brought order out of chaos and made automobile shows truly pleasing to look upon, that the pictures created by such uniformity do not have the same effect on foreign eyes—and not unfriendly eyes at that—is evidenced by the case of W. M. Letts, of Charles Jarrott & Letts, Ltd., of London, who last month visited the United States and viewed the Madison Square Garden show, the Importers' Salon, the Grand Central Palace Show and also some of the automobile factories in Detroit, Mich. He did not come as a stranger, for he had made twelve previous journeys to this country, and as he handles American cars as well as British and Continental productions his views of the shows and of other things are not those of an unfriendly critic. He gave voice to them on his return to London.

"The great event to which I was looking forward," he says, "was the exhibition in Madison Square Garden. The New York Sunday papers came out with a wonderful description of the decorations and all that had been done in the Garden in preparing for the motor show, which led me to believe that their scheme of decoration would be something worth seeing. From this point of view I must say I was very disappointed. American manufacturers have a lot to learn with regard to making an exhibition sufficiently attractive to secure the class of people who have money and are ready to purchase motor cars. A good deal has been said on this side about uniform signs and stand decorations; but although I shall always fall in with the majority, whatever the S. M. M. T. here decide to do at Olympia, I shall beforehand voice my protest against uniform signs and stand decoration. I think it is a great mistake, if New York is anything to go by.

"In spite of the fact that the promoters of the show arranged to have 'society' days, 'engineering' days, etc., as far as I could gather there was nothing like the society element compared with the people who attended the Olympia exhibition; and I could really see no reason why they should attend, because most of the exhibits were only chassis, or cars with standard open bodies, hoods and glass screens. It could not be compared with the English or Continental exhibitions, where the endeavor is to make a very fine exhibit of finished covered cars. At the Garden show there was nothing of this to be seen, except in a very few instances. I think, however, that in future

years more attention will be paid to exhibiting covered cars. From the dealer's or agent's point of view, no doubt he could see everything he wanted, and the show was all he desired. . . .

"The feature of the Madison Square Garden exhibition was the self-starter, which was fitted to most cars; or I was told one would be fitted. Everywhere was a cry of self-starters, either electric, compressed air, spring, acetylene or other types. As I propose to deal with the acetylene starter at another time, I will not say much about this now, except that the self-starter which is the most popular and most simple is the acetylene, and although there are several makes of these the Disco is the one most used in America. Manufacturers are adopting self-starters of some form or other on all their cars, and, judging from what I have seen in New York, I think that at the Olympia exhibition of 1913 the majority of cars shown will be fitted with a self-starter, for I believe this will be one of the developments of the very near future.

"Taking the show as a whole. I would say there was a big improvement over exhibitions of previous years, so far as the goods were concerned, but from an attractive and decorative point of view, in my opinion, they have not advanced.

After attending the various New York shows, Letts went to Detroit for a hurried visit to the big factories there. He openly confesses his amazement at the enormous quantities of cars manufactured and the systems in use to keep check upon production, and then discusses the respective qualities of American and English low and medium-priced cars.

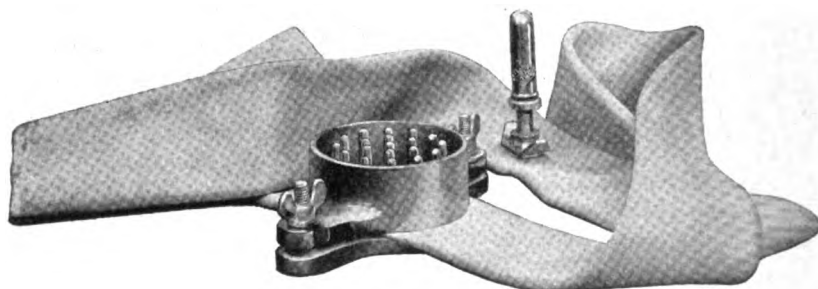
"My opinion," he declares, "is, so far as the small, cheap car is concerned, that it is going to be very difficult for the English manufacturer to compete, but when it comes to a car selling at between \$1,500 and \$2,000, I think the American manufacturer is right up against competition with the English; and there is no question that, as far as workmanship and finish are concerned, the Americans cannot compete with this country.

"Now, without entering into politics, I think what surprises the American manufacturer more than anything else is that in England we do not treat them in the same manner that they treat us. Before we can land an English car in the United States there is a duty of 45 per cent. to be paid, which places the American manufacturer in a very enviable position, but when he sends cars into our country he has not to pay a cent. From a common-sense point of view it is most absurd, not to say unfair, to this country; and I have come back from America feeling there is one thing in which I would like to copy them—in having a tariff on motor cars for England. It is all very well to say that the English manufacturer should try to compete against the Americans. In my opinion he has not a chance; and I think that the United States has a

very fine opportunity of capturing the motor trade in Canada, and at the same time getting a good slice of our business there and likewise our colonies, all of which we ought to have. But still, I conclude by saying that in the end the British manufacturer will win out, and I believe that the English car will be the car which will be known all over the world, with the exception, probably, of America."

Simplicity in Portable Vulcanizers.

Though there are numerous portable tire vulcanizers of the steam and electric and gasoline heated varieties on the market, there are few which can compare either in simplicity of construction or operation or force with one which has just been brought out by the McGraw Tire and Rubber Co., of East Palestine, Ohio. It is styled the Imperial and, as may be seen in the accompanying illustration, it is simply a dish-shaped receptacle arranged to be clamped over the tube to a metal base. In opera-



SHOWING APPLICATION OF IMPERIAL VULCANIZER

tion the vulcanizer is delightfully simple and merely requires that a small quantity of gasoline be placed in the "dish" and lighted, when the heat which is generated is conducted downward by means of a number of conical fingers which project upward through the burning fluid. By reason of the liquid fuel below the flame, and between it and the metal which comes in contact with the tube, the temperature is so controlled that there is no possibility of the tube being burned. One of the features which commends it, and which should operate to cause as nearly perfect vulcanization as can be obtained is that the heat is applied gradually until the maximum degree is obtained, when it gradually falls off to practically nothing when the repair is complete, the operation requiring approximately 15 minutes. The price of the device, together with sufficient prepared rubber to repair 40 ordinary punctures, is \$3.50.

When Friction Disks Cause Thumps.

Under ordinary usage and with only that degree of care in handling which usually is given other types of automobiles, the friction driven car should give, and will give, eminently satisfactory results. There is no drive which may be more efficient or more silent in operation, though there are several matters which require attention if its efficiency is to be maintained at the high-

est. Because the driven disk touches the driving plate at only one point, it is inexpedient to "slip the clutch," if the operation may be so styled, for the reason that there is danger of wearing a flat spot on the paper friction material. Even a minute "flat" will cause an uncomfortable thump, and once a flat spot appears it will increase in size rapidly until, after a very short time, it will be necessary to have the disk refaced. If taken in time, it may be possible to turn the facing down a fraction of an inch in a lathe to remove the flat spot. It rarely is necessary to "slip the clutch," however, because the very low gear ratio obtainable for starting makes possible practically instantaneous connection between the engine and the driving wheels without harmful results. Though the cost of replacing the friction material is comparatively small, it is well to obviate the necessity as long as possible by permitting the minimum amount of slippage between the driving and driven members both when

starting and when running. As oil or grease cause slippage great care should be taken to see that the faces which come into friction contact are kept clean.

Peroxide to Make Lamps Burn Brighter.

Though peroxide of hydrogen is a common enough substance in the average home, where it is used to a greater or lesser extent for medicinal purposes—and, as a rule, for medicinal purposes alone—it remained for a British chemist to discover that it has another use far removed from that to which time-honored custom has relegated it. He discovered that if one-half ounce of peroxide, as the name of the substance generally is abbreviated, was added to each 20 ounces of water in an acetylene gas generator the candlepower of the lights was increased no less than 50 per cent. The answer to the seeming miracle is simple, of course, inasmuch as peroxide is merely water which contains a greater percentage of oxygen than water ordinarily contains. As oxygen supports combustion, though it will not burn alone, the brightness with which the acetylene gas burns is increased by the increased volume of oxygen which is mixed with it. Peroxide may be purchased in varying strength from any druggist; "20 volumes" strength is the proper kind to use for the purpose of increasing the illuminating power of acetylene gas.

Causes That Contribute to Ball Bearing Failures

Despite the perfection to which the manufacture of ball bearings has been brought and the relatively infrequent failure of bearings in service, the fact remains that there are occasional cases of fractured balls or races or of excessive or apparently unaccountably irregular wear. Though it is apparent that some of them at least may be laid at the door of the bearing manufacturer, though it may be due to no fault of his but rather to some indistinguishable flaw in construction, it is equally apparent, and in view of the specialization in manufacture which is necessary it is quite logical, that the greatest trouble may be traced directly to the car manufacturer in faulty mounting or in the use of bearings of other than the proper size for the load. The life of the bearing manufacturer has not been an easy one; car manufacturers have been slow to realize that none is better able to advise the size of bearings to be used for a specific purpose and the method of mounting than the bearing manufacturer, and as a result, though failures really are scarce, they are not quite as scarce, perhaps, as they might be if automobile manufacturers had come to the realization sooner.

"There are few appliances which behave so well when properly mounted, but which give trouble so quickly if one or two small details are not attended to," said G. F. Barrett in a paper which he read before the British Institution of Mechanical Engineers in London, on Wednesday, 14th inst. The paper deals principally with improper methods of mounting, to which, Barrett stated, are directly attributable the greatest number of failures.

"The failure of ball bearings, apart from that due to direct overload," he said in part, "may be roughly attributed to five causes: faulty design, material, workmanship, mounting and bad usage. As regards the first of these, Professor Stribeck proved beyond doubt that in a ball bearing to carry journal loads the balls should have only two points of contact; that is to say, one on the stationary and one of the revolving race, and that these two points of contact should be in a line at right angles to the axis or rotation of the bearing and parallel with the load. . . .

"The curvature of the ball race naturally plays an important part in the life of a ball bearing. Owing to the fact that the path of the balls round the inner ring is convex and round the outer ring concave, it follows that the track on the inner ring is the weaker of the two; and for this reason the curvature of the ball race in this ring is made to a smaller radius than the curvature

of the outer race, so that the load carrying capacity of the two races shall be the same. The nearer the curvature of the ball races approaches that of the ball, the greater the load it will sustain, but the friction and wear, of course, go up in proportion. It is found in practice that a curvature about five to ten per cent. larger than the radius of the ball is the most suitable.

"A cage is necessary to separate the balls, as, if no cage is provided, the slight difference in the speed at which the balls travel round the races, caused by the deflection of the balls as they go round under the loaded portion, bunches the balls together, and the friction caused by the points of contact of the balls with each other, running in opposite directions at a very high speed, produces such intense local friction that the steel is worn or burnt away so as to form grooves or flats around the balls. The pressure required to keep the balls apart, provided that the bearing is properly mounted and the load applied correctly, is very slight indeed—so slight as not to cause any appreciable wear whatever on the ball cages. If, however, loads come upon the races which tend to cant them out of true concentricity with each other, some of the balls will be driven up the sides of the track, and the alteration in the speed of these balls rolling round a larger diameter of track will exert sufficient pressure to destroy any cage unless it is of substantial construction. A great deal of trouble in the past has been caused by the cages being too light and flimsy.

"The comparative strength of the various designs of a journal bearing of a given size will depend, other things being equal, upon the number and size of the balls; the number of balls is regulated by the amount of space that it is considered desirable should be left for providing room for a strong and efficient cage, and the size of the balls by the thickness that is required for the ball races. In bearings having unbroken rings—that is, without transverse slots, the number of balls is limited to that which can be got in by placing the rings eccentric. In bearings with a transverse slot for inserting the balls, the number is only limited by the cage, but great care has to be taken in producing these slots that they do not interfere with the continuity of the ball track, and that the bearing rings are not overstrained in introducing the balls, or the balls themselves damaged. Provided that these points receive every attention in manufacture, the latter form of bearing is considerably the stronger.

"Another form of bearing which has recently been brought into prominence is that

having two rows of balls running in two grooves in the inner race, and in an outer race ground spherical from the center of the bore. By this means two or three balls at the least must always be carrying the load as against one or two with the single row, but here, again, this is obtained at the sacrifice of making the outer ball race of so much greater curvature than the ball that the load carrying capacity is not increased above that of the single row bearing.

"As regards material and workmanship, it is hardly necessary to say that these should be the very finest possible. Only the most uniform and the very hardest material that it is possible to obtain should be used for the ball races, owing to the tendency that the metal has to flow away from beneath the ball under pressure. The ball races should be accurately ground and polished, as any roughness left from the emery wheels will make the bearings noisy.

"A most important point is the accuracy of the steel balls. These can now be obtained commercially correct to standard size to within one ten-thousandth part of an inch, and this is not, as with many articles, merely a figure of speech, but is absolutely true. It is this feature, as much as any, which has made ball bearings a success. The steel used for the balls should have a high elastic limit when hardened, as it is the elastic limit of the surface of the balls which is the limiting factor in their load carrying capacity. The cages should be made of a tough and uniform yellow metal, as steel or iron tend to lap down the balls. Owing to the extreme accuracy which is now possible in the commercial manufacture of steel balls and ball races and the reliability of the material, failure due to faulty material or workmanship should be of rare occurrence.

"When ball bearings first were introduced, the principles of mounting were not thoroughly understood, and a good many failures could be, and are still, very largely attributable to this cause. First and foremost is the question of side or axial thrust in connection with journal bearings. It is quite impossible to design a ball bearing with a single row of balls which will carry more than a small amount of both journal and side thrust, because of the enormous wedging action tending to drive the balls up and into the races and burst them. . . .

"In this connection it is interesting to note that some manufacturers of this type of ball bearing advertise that their particular make of bearing will carry as much as 25 per cent. of side thrust, but when these

bearings are supplied they are particularly careful to print on the boxes which contain the bearings a warning to the effect that the bearing must not be clamped sideways, and that special care must be taken to see that the outer ball race has play sideways. It is, of course, obvious that if these instructions are carried out it is impossible for any side thrust to come upon the bearing. It is this wedging action which destroys the so-called cycle type of bearing and all others in which the load is not carried across the diameter of the ball parallel with the load and at right angles to the axis of rotation of that bearing. This has been so abundantly proved in the earlier patterns of motor cars in which the cycle type of bearing was largely used with such bad results that it is difficult to understand how this type can still be tolerated for anything but the light loads met with in cycle construction. It is, however, still met with under fancy names, and is claimed to carry both axial and radial loads.

"For the front axles of moderate-sized touring cars, the single row type of journal bearing is found sufficient to control the shocks and jars which come upon it on the road, and also the side thrust when turning corners. On commercial vehicles, however, which have to carry heavier loads and run considerably greater mileage, and more particularly on taxicabs, which have, by the police regulations, to turn round in a very small radius, it has been found absolutely essential to provide thrust bearings in the front hubs where ball journal bearings are used, so that the latter have only to carry the pure journal load. This, of course, also applies to the heavier touring cars. It is not, of course, always essential that a ball thrust bearing shall be used to carry the side thrust when this is only slight, provided some other efficient means is employed, such as, for instance, on the layshaft in a gear box, where hardened steel pins can be employed on the ends of the shaft.

"Another cause of failure has been due to the mounting of the ball bearings in split housings in the same way as the brasses of a plain journal bearing. This often leads to the distortion of the outer ball race either by being nipped across the joint in the housing or at right angles to this. When this form of housing has to be employed, the bearings should be inserted in the bore after the cap has been firmly screwed down to see that it is a correct sliding fit. The same thing happens when the outer race is held in position by means of a set-screw; the bearings invariably fail on the ball race just underneath the mark caused by the set-screw, and at the opposite diameter, showing that the race has been distorted and the balls nipped between the two races. If the inner race is forced on to a shaft which is out of round, the ball race will be distorted and cause trouble.

"Another cause of failure has been found to be due to the holding of the inner race on the shaft by means of a key; when this

is driven up tight it has distorted the inner race and caused failure for the same reason. Both the inner and outer races, where they have to be held, should be a tight fit and clamped sideways against a flat shoulder truly bored or turned at right angles to the axis of rotation, and clear of the radius and burrs. The outer ball races are sometimes found distorted through being mounted in housings that are not bored truly round. It should not be forgotten that ball races are only hardened steel liners, and therefore very easily deformed, and that, owing to the parts in contact being all of hardened steel, the least deformation will nip the balls. It is therefore extremely important that the bearings should be truly and firmly supported both on the shaft and in the housings.

"Regarding the assembling of the bearings in the assembling shops, it is important that ball bearings be not driven into position through the balls and races; that is to say, when mounting the inner race on a shaft, the outer race should not be touched. Noisy bearings are generally caused by the indentations made in the races by the balls when the bearings have been forced into position through the medium of the balls. The same remarks apply, of course, to dismantling the bearings. Great care should be taken not to expose the bearings to dirt or moisture. It is unfortunately a not infrequent thing to observe ball bearings taken from the boxes in which they are packed and allowed to lie about on a dirty bench or even on the floor. Owing to the grease with which they are covered, they very easily pick up any dirt which may be about, and when once this gets into the ball races it is not an easy matter to get rid of it. The bearings should be kept in their boxes until the very last minute, should be assembled directly, covered as much as possible with grease, and boxed in so that dirt cannot settle upon them.

"An excessive amount of wear in the bearings of gear boxes is frequently met with, and this has in some cases been directly traced to emery being left in the boxes from the operation of grinding in the gears in position. Slave races are, of course, used for this purpose, and are removed from the boxes when the grinding is finished. The boxes are then carefully washed in a number of different baths of paraffin, and then allowed to drain and dry. This, nevertheless, is not sufficient, as, however carefully it is done, emery is still found clinging to the walls of the box and in the pockets and corners. They should be finally washed by a good force of water from a hose pipe to drive away all grains that are left. A good method is, after washing, to paint the inside of the box as well with a suitable varnish, which fixes any grains of emery that have been left, and prevents their eventually getting into the bearings. This will also fix flakes of aluminum which come from the castings.

"Many of the so-called cup greases and solidified oils contain saponifiable matter which readily absorbs moisture from the ordinary atmosphere. Not only does the presence of a small amount of moisture in the grease tend to create rusting in the ordinary sense of the word, but it also produces a different form of oxidation which it is difficult to account for. This effect often looks similar to that obtained by dilute acid, and goes on even when the bearings are wrapped in oiled paper and kept in dry stores. It produces an eating away of the surface of the steel around the point of contact of the ball on the ball race, and must play some part in destroying the surface of the ball bearings when they are working under ordinary conditions. The etching effect under these conditions is so fine as to be difficult to detect, but it must account for some of the wear which takes place in bearings where the grease used has moisture absorbed in it. This effect does not happen with pure mineral grease. It is also well to avoid the use of some of the so-called solidified oils, as they do not only contain saponifiable matter, but also an added body which is introduced to form a thickening. This has been found to consist of such material as French chalk, and in one case where ball bearings were found to wear out rapidly, the grease was analyzed, and found to contain as much as 75 per cent. of this material. Needless to say, it acts as a fine lapping compound, and soon wears away both the balls and races.

"The ideal is always impossible to attain, but it should be approached as nearly as possible. It is a well-proved fact that a ball bearing running under the nearest ideal conditions—say on an electric motor in a clean shop—will run for years, day and night, at high speeds without showing any signs of wear whatever. Such conditions it is impossible to obtain in motor car practice, but the aim should be to approach this as nearly as possible.

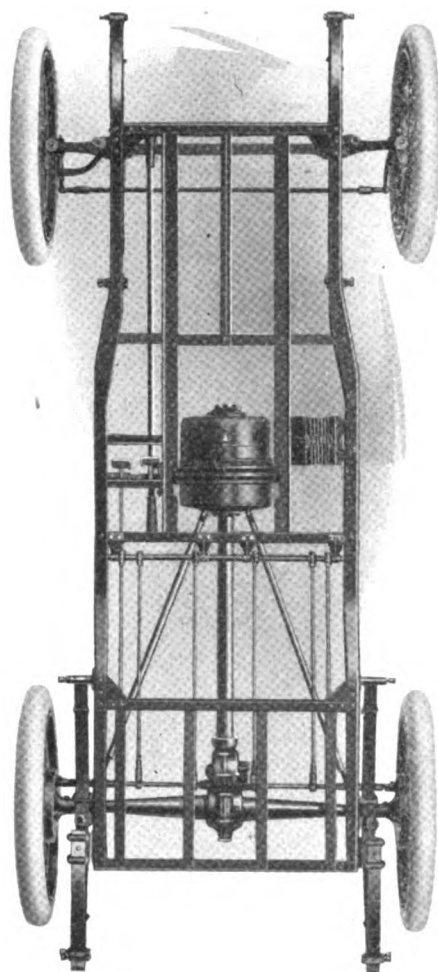
"Accidents must happen, and some ball bearings will fail and require renewal. This latter should be done as promptly as possible. A point that will assist this to an enormous extent is standardization and the reduction of the number of types and sizes to a minimum. When a bearing fails that is not a standard size and type and a new one has to be made specially, the vexatious delay that results cannot but have a bad effect on the type of car that requires it. It is recognized throughout the world that all component parts of machinery should be as far as possible of standard sizes and interchangeable. It is difficult to do this with certain parts, but it would appear as though ball bearings lend themselves very well to this ideal. This would tend greatly to simplify the work of making parts interchangeable and of reducing the stocks to be carried both in the manufacturing shops and in repair establishments and garages."

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The Standard Electric Car Co., Jackson, Mich.



999,732. Air Brake for Vehicles. Charles Anspach, Amherst, Neb. Filed Apr. 15, 1910. Serial No. 555,568.

1. In an air brake apparatus for vehicles, a suitable tank or reservoir, an automatic pump regulator communicating with said reservoir, a piston located within said regulator and normally closing the communication between the reservoir and regulator, a screw threaded stem passing through one end of the regulator and adjustable from

the outer end of said regulator, the inner end of said stem being provided with a head, a coil spring interposed between said head and plug and a suitable supply pipe leading from the regulator and provided with two ports, one of which is located at the lower end of the regulator and the other beyond the plug when the latter is in its normal condition, said supply pipe being in communication with a suitable apparatus for automatically shifting the clutch mechanism of the device, as and for the purpose described.

999,763. Gas Engine Starter. Josiah P. Edwards, Knightstown, Ind. Filed July 23, 1910. Serial No. 573,577.

1. The combination, with an internal combustion engine, of an air reservoir, a diaphragm pump arranged to be acted up-

on by the exploded gases of one of the engine cylinders, said pump having air inlet and outlet valves upon that side opposite that affected by the engine gases, an air reservoir, a connection between said air reservoir and the outlet valve of the pump, a valve box, a connection between said valve box and the reservoir, passages from said valve box to the individual cylinders of the engine, a valve for each of said passages, means for normally holding each of said valves closed, means for operating said valve, and means for rendering active or inactive the connection between said operating means and said valves.

999,810. Tire. David Lippy, Mansfield, Ohio. Filed Sept. 15, 1909. Serial No. 517,814.

1. In a tire the combination of a tube, an



INDEX TO ADVERTISERS



A		O	
Abbott Motor Car Co.....	1002	Owen, R. M., & Co.....	992
Adamson Mfg. Co.....	1003	P	
Ajax-Grieb Rubber Co.....	988	Packard Electric Co.....	1003
American Ball Bearing Co.....	1003	Parish Mfg. Co.....	988
American Motors Co.....	1000	Parish & Bingham Co.....	1003
American Starter & Carburetor Mfg. Co.....	989	Penn Spring Works.....	992
Argo Electric Vehicle Co.....	952	Perfection Spring Co.....	992
Atwater-Kent Mfg. Co.....	945	Petrel Motor Car Co.....	999
Automobile Supply Mfg. Co.....	997	Pierce-Arrow Motor Car Co.....	F. C.
B		Pullman Motor Car Co.....	999
Badger Brass Mfg. Co.....	1003	R	
Barthel, Daly & Miller.....	1004	R. C. H. Corporation.....	1000
Bartholomew Co.....	993	Remy Electric Co.....	994
Benz Auto Import Co.....	996	Royal Equipment Co.....	998
Bosch Magneto Co.....	995	S	
Bossert Co.....	992	Sackman Mfg. Co.....	1003
Bower Roller Bearing Co.....	998	Safety Tire Gauge Co.....	988
Bretz, J. S., Co.....	944	Salisbury Wheel & Mfg. Co.....	1004
Briggs-Detroit Co.....	999	Schrader's Sons, A., Inc.....	993
Brown-Lipe Gear-Chapin Co.....	997	Selden Motor Vehicle Co.....	1004
Bush Mfg. Co.....	988	Shaler, C. A., Co.....	951
C		Shawmut Tire Co.....	996
Cartercar Co.....	1001	Sparks-Withington Co.....	995
Century Electric Motor Car Co.....	998	Speedwell Motor Car Co.....	1001
Champion Ignition Co.....	995	Splitdorf, C. F.....	995
Champion Spark Plug Co.....	1003	Springfield Metal Body Co.....	992
Clark-Carter Automobile Co.....	1000	Standard Electric Car Co., The.....	985
Classified Advertising.....	987	Standard Oil Co.....	996
Colby Motor Car Co.....	1002	Standard Roller Bearing Co.....	988
Colonial Electric Car Co.....	1002	Standard Tire Protector Co.....	942
Consolidated Mfg. Co.....	955	Stearns, F. B., Co.....	1001
Continental Motor Mfg. Co.....	992	Stewart & Clark Mfg. Co.....	946
Covert Motor Vehicle Co.....	1000	T	
Cox Brass Mfg. Co.....	953	Thomas, E. R., Motor Car Co.....	992
Cramp, Wm. & Sons, Ship & Engine Building Co.....	997	Timken Detroit Axle Co.....	949
D		U	
Dayton Rubber Mfg. Co.....	938	United Rim Co.....	997
Dean Electric Co.....	940	U. S. Auto Horn Co.....	998
Diamond Rubber Co.....	998	United States Tire Co.....	Inside Caver-937
E		V	
Electric Welding Products Co.....	1003	Velie Motor Vehicle Co.....	999
Empire Tire Co.....	1000	W	
F		Warner Gear Co.....	997
Fedders Mfg. Wks.....	994	Warner Instrument Co.....	994
F. I. A. T.....	996	Weed Chain Tire Grip Co.....	992
Firestone Tire & Rubber Co.....	989	Western Motor Co.....	989
Fisk Rubber Co.....	988	Wetherill Finished Castings Co.....	1004
Flanders Mfg. Co.....	954	Willard Storage Battery Co.....	988
Ford Motor Co.....	1002	Willys-Garford Sales Co.....	B. C.
G		Willys-Overland Co.....	956
Gray & Davis.....	948	Winton Motor Car Co.....	1001
H		Wisconsin Motor Mfg. Co.....	989
Goodyear Tire & Rubber Co.....	988	N	
Grossman, Emil, Co.....	992	National Motor Vehicle Co.....	1001
I		Nordyke & Marmon.....	1001
Hartford Suspension Co.....	988	Not-A-Crank Gas Engine Starter Co.....	998
Havers Motor Car Co.....	1000	J	
Hayes Mfg. Co.....	950	Jackson Automobile Co.....	997
Haynes Automobile Co.....	1001	Jamestown Wheel & Mfg. Co.....	988
Henderson Motor Sales Co.....	1002	Jeffery-DeWitt Co.....	998
Hot-Spark Plug Co.....	998	Jeffery, Thomas B., Co.....	1001
Hupp Motor Car Co.....	999	Jones, Phineas, & Co.....	997
Hyatt Roller Bearing Co.....	947	K	
J		Kellom, Chas. F., Co.....	988
Inner Shoe Tire Co.....	992	Kelly-Springfield Tire Co.....	991
International Accessories Corp.....	991	Kinsey Mfg. Co.....	990
Inter-State Automobile Co.....	1002	Kissel Motor Car Co.....	1000
Invincible Starter Co.....	999	Kline Motor Car Corp.....	1004
K		Knox Automobile Co.....	999
Jackson Automobile Co.....	997	L	
Jamestown Wheel & Mfg. Co.....	988	Lauth-Juergens Motor Car Co.....	990
Jeffery-DeWitt Co.....	998	Leather Tire Goods Co.....	992
Jeffery, Thomas B., Co.....	1001	Locomobile Co.....	988
Jones, Phineas, & Co.....	997	Lovell-McConnell Mfg. Co.....	Inside B. C.
L		M	
Lauth-Juergens Motor Car Co.....	990	McGraw Tire & Rubber Co.....	989
Leather Tire Goods Co.....	992	McIntyre, W. H., Co.....	999
Locomobile Co.....	988	Marquette Co.....	943
Lovell-McConnell Mfg. Co.....	Inside B. C.	Marion Sales Co.....	1002
M		Mayo Radiator Co.....	939
McGraw Tire & Rubber Co.....	989	Metz Co.....	1002
McIntyre, W. H., Co.....	999	Michelin Tire Co.....	997
Marquette Co.....	943	Michigan Buggy Co.....	941
Marion Sales Co.....	1002	Michigan Crank Shaft Co.....	992
Mayo Radiator Co.....	939	Miller, Chas. E.....	939
Metz Co.....	1002	Mosler, A. R., & Co.....	988
Michelin Tire Co.....	997	Moss Photo Engraving Co.....	996
Michigan Buggy Co.....	941	Motor Car Equipment Co.....	988
Michigan Crank Shaft Co.....	992	Mott Wheel Works.....	1004
Miller, Chas. E.....	939	Motz Tire & Rubber Co.....	988
Mosler, A. R., & Co.....	988	N	
Moss Photo Engraving Co.....	996	National Motor Vehicle Co.....	1001
Motor Car Equipment Co.....	988	Nordyke & Marmon.....	1001
Mott Wheel Works.....	1004	Not-A-Crank Gas Engine Starter Co.....	998
Motz Tire & Rubber Co.....	988	O	
N		Owen, R. M., & Co.....	992
National Motor Vehicle Co.....	1001	P	
Nordyke & Marmon.....	1001	Packard Electric Co.....	1003
Not-A-Crank Gas Engine Starter Co.....	998	Parish Mfg. Co.....	988
O		Parish & Bingham Co.....	1003
Owen, R. M., & Co.....	992	Penn Spring Works.....	992
P		Perfection Spring Co.....	992
Packard Electric Co.....	1003	Petrel Motor Car Co.....	999
Parish Mfg. Co.....	988	Pierce-Arrow Motor Car Co.....	F. C.
Parish & Bingham Co.....	1003	Pullman Motor Car Co.....	999
Penn Spring Works.....	992	R	
Perfection Spring Co.....	992	R. C. H. Corporation.....	1000
Petrel Motor Car Co.....	999	Remy Electric Co.....	994
Pierce-Arrow Motor Car Co.....	F. C.	Royal Equipment Co.....	998
Pullman Motor Car Co.....	999	S	
R		Sackman Mfg. Co.....	1003
R. C. H. Corporation.....	1000	Safety Tire Gauge Co.....	988
Remy Electric Co.....	994	Salisbury Wheel & Mfg. Co.....	1004
Royal Equipment Co.....	998	Schrader's Sons, A., Inc.....	993
S		Selden Motor Vehicle Co.....	1004
Sackman Mfg. Co.....	1003	Shaler, C. A., Co.....	951
Safety Tire Gauge Co.....	988	Shawmut Tire Co.....	996
Salisbury Wheel & Mfg. Co.....	1004	Sparks-Withington Co.....	995
Schrader's Sons, A., Inc.....	993	Speedwell Motor Car Co.....	1001
Selden Motor Vehicle Co.....	1004	Splitdorf, C. F.....	995
Shaler, C. A., Co.....	951	Springfield Metal Body Co.....	992
Shawmut Tire Co.....	996	Standard Electric Car Co., The.....	985
Sparks-Withington Co.....	995	Standard Oil Co.....	996
Speedwell Motor Car Co.....	1001	Standard Roller Bearing Co.....	988
Splitdorf, C. F.....	995	Standard Tire Protector Co.....	942
Springfield Metal Body Co.....	992	Stearns, F. B., Co.....	1001
Standard Electric Car Co., The.....	985	Stewart & Clark Mfg. Co.....	946
Standard Oil Co.....	996	T	
Standard Roller Bearing Co.....	988	Thomas, E. R., Motor Car Co.....	992
Standard Tire Protector Co.....	942	Timken Detroit Axle Co.....	949
Stearns, F. B., Co.....	1001	U	
Stewart & Clark Mfg. Co.....	946	United Rim Co.....	997
T		U. S. Auto Horn Co.....	998
Thomas, E. R., Motor Car Co.....	992	United States Tire Co.....	Inside Caver-937
Timken Detroit Axle Co.....	949	V	
U		Velie Motor Vehicle Co.....	999
United Rim Co.....	997	W	
U. S. Auto Horn Co.....	998	Warner Gear Co.....	997
United States Tire Co.....	Inside Caver-937	Warner Instrument Co.....	994
V		Weed Chain Tire Grip Co.....	992
Velie Motor Vehicle Co.....	999	Western Motor Co.....	989
W		Wetherill Finished Castings Co.....	1004
Warner Gear Co.....	997	Willard Storage Battery Co.....	988
Warner Instrument Co.....	994	Willys-Garford Sales Co.....	B. C.
Weed Chain Tire Grip Co.....	992	Willys-Overland Co.....	956
Western Motor Co.....	989	Winton Motor Car Co.....	1001
Wetherill Finished Castings Co.....	1004	Wisconsin Motor Mfg. Co.....	989
Willard Storage Battery Co.....	988	X	
Willys-Garford Sales Co.....	B. C.	Y	
Willys-Overland Co.....	956	Z	
Winton Motor Car Co.....	1001	AA	
Wisconsin Motor Mfg. Co.....	989	AB	

armor surrounding the outside of the tube, said armor comprising two sets of plates each extending in similar regular order and arranged in layers one above the other around the circumference of the tire, the plates of each layer being arranged edge to edge and substantially abutting some of the plates being wider than the other plates, and some of the plates of one set overlapping the plates of the other set.

999,826. Vehicle Spring. Randolph M. McGahee, Tampa, Fla. Filed Dec. 30, 1910. Serial No. 600,039.

In an elliptical spring, the combination of several leaves provided upon their even edges with lug shoulders, the contact faces of which face outwardly toward the ends of the leaves, a plate disposed adjacent the uppermost leaf and having shoulders at each end, the contact faces of which face one another and are disposed in positions beyond the first contact faces, staples arching down over the leaves with their side portions in contact with the first contact faces while their upper portions are in contact with the second contact faces, a second plate disposed below the lowermost leaf and through which the threaded ends of the staples extend, and nuts fixed to the threaded ends of the staples for holding the structure together.

999,838. Lubricator. William L. Morris, Cleveland Ohio, assignor to S. F. Bowser & Co., Inc., Fort Wayne, Ind., a Corporation of Indiana. Filed Nov. 26, 1906. Serial No. 345,007.

1. In an oiling device, the combination with an oil cup having an oil outlet, of a valve controlling such outlet, said valve being operable by the pressure of the oil in said cup to open such outlet, and means adapted to operate said valve in either direction independently of such oil pressure.

999,876. Worm Drive and Compensating Gearing. David E. Ross, Brookston, Ind., assignor to The Ross Gear & Tool Co., La Fayette, Ind., a Corporation of Indiana. Filed Dec. 16, 1908. Serial No. 467,776.

1. In gearing, the combination with a pair of aligned shaft or axle sections, of bevel gears secured to the adjacent ends of said sections, a worm gear mounted coaxially with respect to the said sections, a spider within the said worm gear, one or more journal pins mounted radially in said spider, said pins being provided with slots in their outer ends, keys connecting the spider and the worm gear and passing through the slots in the ends of said journal pins, a planetary pinion mounted on each of said pins and meshing with each of the said gears, and a worm meshing with and driving the worm gear.

999,939. Grease Gun. Alfred T. Wood, Defiance, Ohio. Filed Nov. 4, 1910. Serial No. 590,763.

1. The combination with a grease cartridge having an open end, of a holder into which such cartridge removably fits, said holder comprising a body part having a discharge nozzle at one end and a plug receiving part at its opposite end, a plug threaded into said part and adapted to act on the cartridge to force it to a close seat against said nozzle with its open end in register with the nozzle bore, and means for forcing matter through said cartridge.

999,941. Automobile Engine. Fred S. Yale, New York, N. Y. Filed Mar. 23, 1909. Serial No. 485,212.

1. In an automobile engine, the combination of a valve stem and a push rod, of a

separate disk normally seating on the end of said push rod and movable independently thereof, and a holder mounted on the valve stem engaging the disk to prevent displacement thereof and provided with a central passage permitting said valve stem to contact directly with said disk, substantially as described.



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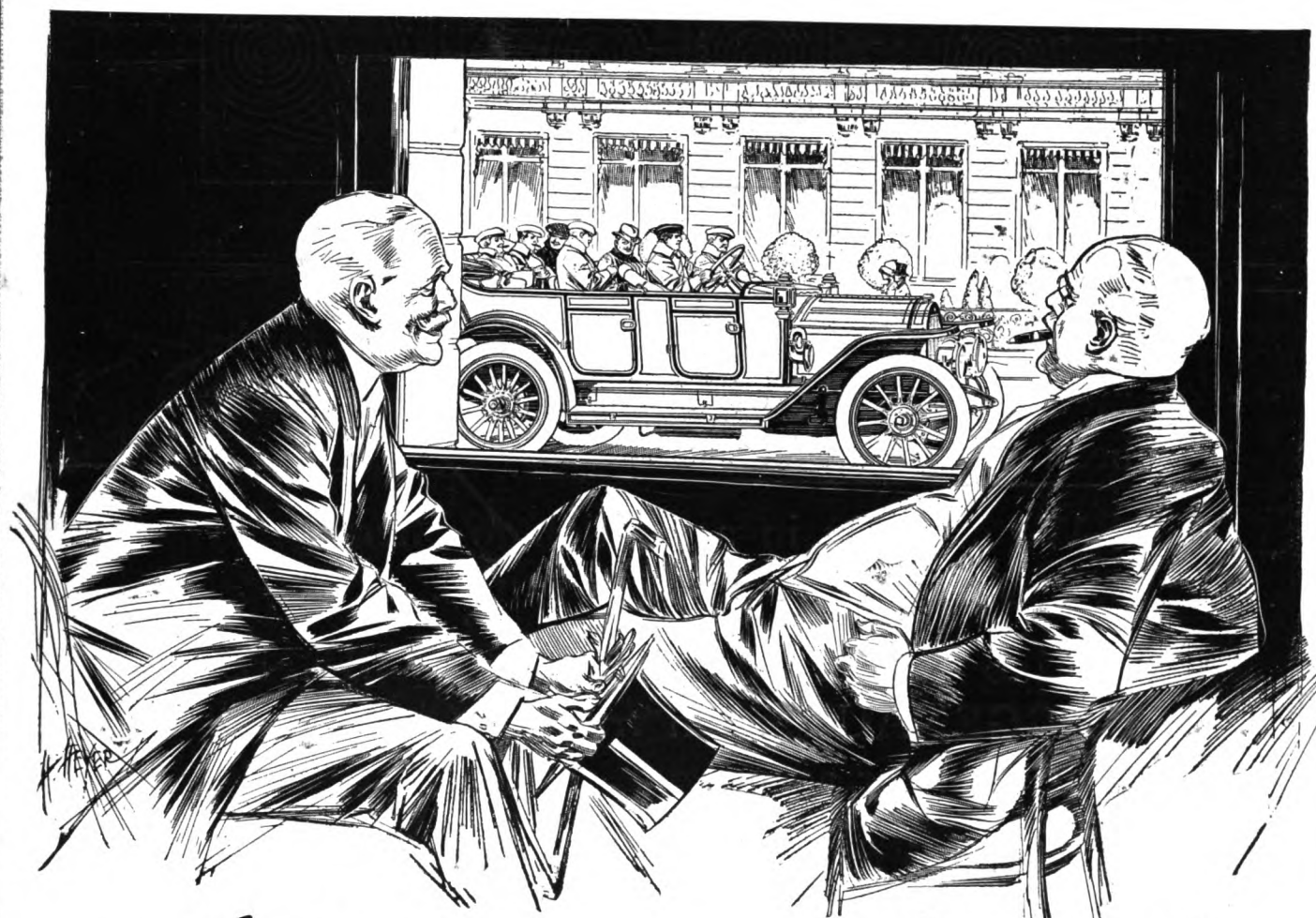
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 11

New York, March 7, 1912

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Two dollars a year



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THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, March 7, 1912.

No. 11

TO MERGE SPRINGFIELD COMPANIES

New York Banker Fathers Project to Combine Automobile and Body Plants—Italian Truck Also in View.

Negotiations which are pending and far advanced probably will result in the formation of a new company which will not only take over the Springfield Metal Body Co., of Springfield, Mass., and the Brightwood Motor Mfg. Co., of the same city, but which will broaden the scope of both. In his private capacity, Jason Waters, who is of the firm of Strong, Sturges & Co., New York bankers, is engineering the project, his firm being in no way connected with the transaction.

The Springfield Metal Body Co. is well and favorably known as the manufacturer of the productions indicated by its title; the Brightwood company, not so well known, has been manufacturing the Orson car, around which many large and picturesque stories have been woven. It was reputed to represent the idea of a number of millionaire New Yorkers, 100 of whom placed orders for the cars some two years ago, and who received them slowly.

When the new company which he proposes forming is brought into being, it is Waters's idea not only to continue the manufacture of Springfield metal bodies for the trade at large, but to enlarge the Brightwood Motor Mfg. Co. and to build the Orson car for the general public instead of a chosen few. Also included in the plan is the manufacture of the S. P. A. truck, an Italian creation, of which Waters holds a high opinion.

Separate Factory for Hupp-Yeats.

In order to facilitate the production of its Hupp-Yeats electric cars, the R. C. H. Corporation has leased the factory buildings on Monroe avenue, Detroit, formerly occupied by the Herbert Mfg. Co., which will be devoted wholly to the production of the Hupp-Yeats cars. Heretofore they

have been built in the same plant on Ly-caste street in which the R. C. H. gasoline cars are produced, and their removal to separate buildings naturally will afford more room for the manufacture of the R. C. H. cars, which has been much needed. Although an assembling building, 205x400 feet, just has been added to the R. C. H. plant, other enlargements are in progress, among them a new office building, a new test shop, a new power house and a bigger foundry.

Bailey Takes Charge of Abbott's Affairs.

Having purchased a considerable interest in the Abbott Motor Co., of Detroit, Clayton E. Bailey, of Jamestown, N. Y., has been elected first vice-president of the company and chairman of the board of directors, and in a large measure will discharge the duties of the president, C. W. Jamieson, of Warren, Pa., whose health, it is stated, is such that even after his recovery he will be unable to resume active duties. Because of Mr. Jamieson's condition of health, and on the recommendation of Mr. Bailey, who has been associated with the Abbott principals in other enterprises, and who is a large investor in natural gas, street railway, mercantile and real estate projects, the board of directors of the Abbott company has placed all matters of policy and management in the hands of an executive committee, composed of M. J. Hammers, general manager; B. C. Spitzley, assistant general manager, and W. T. Bush, sales manager. Bailey himself will be an ex-officio member of the committee.

Becker Heads an Ohio Truck Project.

B. A. Becker, former manager of the Elmore Mfg. Co., Clyde, Ohio, who was one of the owners of the property before it was taken over by the General Motors Co., is at the head of a project which has for its purpose the establishment of a motor truck factory in Clyde. When it is organized Becker will become president of the new company, in which several other former members of the Elmore company and other Clyde business men are interested.

ANOTHER KNIGHT ENTERS THE ARENA

It's a Sleeve-Valve Engine, Too, and Women Are at Bottom of It—"Coincidences" Which They Suggest.

Of the wealth of unknown or unexploited and, therefore, unexpected devices in evidence at the Boston show, which now is in progress, none is so interesting from so many viewpoints as a brand new Knight sleeve valve motor; and it is as ingenious as its surroundings are interesting. It isn't a Charles Y. Knight motor, either: it is Margaret E. Knight's invention. Mention of Charles Y. Knight in the immediate vicinity of the exhibit is not relished, however. It is likely to cause a lifting of eyebrows, if not a polite tilting of noses, accompanied by smiles that are full of suggestion.

Miss Knight herself is 68 years of age, but doesn't look it, and has been "inventing things" since she was 12, when she devised a shuttle for carding machines which still is in use. Her portrait hangs in the United States Patent Office in Washington in token of her fame as the first woman inventor to obtain an American patent. She does not call her latest origination, the sleeve valve engine disclosed at the Boston show, a Knight engine. It is styled the "K-D," the "D" standing for Mrs. and Miss Davidson, who are of the Knight family and are assisting in its financing and exploitation. They all are gentlewomen, keen and alert, who seem sure of their ground.

Directly opposite the K-D motor in the Margaret E. Knight booth is another motor—a single-cylinder stationary motor—bearing in the placard "1896." It's the Charles Y. Knight sleeve valve motor, as sure as fate—the principle is there as plain as day, and the date fairly drips with suggestion.

But if one is so fortunate as to meet Miss Davidson at the booth, he possibly may find that uncommonly bright young woman willing to talk of "Aunt Maggie."

as she calls Miss Knight, but she will not talk overmuch of the "1896" motor and its likeness to Charles Y. Knight's production. With a smile that conveys meaning she will suggest that the world is large and that perhaps there are such things as coincidences, with emphasis on the "perhaps." She will not say much else, unless it be to warn the questioner that it is not wholly safe to mention the name Charles Y. Knight in "Aunt Maggie's" presence or hearing. Miss Knight herself resides in South Framingham, Mass., and prefers not to be seen or to be interviewed, and while Miss Davidson is as polite as can be, she knows leading questions when they are asked, and knows how to lead away from them. "You may draw your own inferences," she will respond, when the effort is made to lead her back to the questions.

Incidentally, Charles Y. Knight was born in Massachusetts and his sleeve valve engine was patented in 1910, the application, however, having been filed in 1904.

The K-D engine, which is described more in detail elsewhere in this issue, differs from all other engines of the sleeve valve type in that the sleeves are semi-circular in shape and overlap each other at the sides—"sliding crescent valves," Miss Knight styles them. Furthermore, they are located not between the piston and cylinder walls, but between the outside of the cylinder walls and the water jacket. They are separately actuated, a single port in one serving to register with a port in the cylinder wall for the admission of gases and a port in the other registering with a similarly shaped port and controlling the exhaust. In addition to the usual connecting rod each piston also has a piston rod, and the exhaust gases are led first into a space below the pistons and thence out by means of an orthodox exhaust manifold.

To Make Sturdy Plugs in Chicago.

Joseph B. Diebler and H. S. Stern, who have been identified with the automobile trade in Chicago for some time, have organized the Sturdy Mfg. Co., for the manufacture of a new spark plug, which will bear the name Sturdy. The company is located at 2637 Michigan avenue, Chicago.

Heaslet Rejoins the Studebaker Staff.

James G. Heaslet, who at one time was chief engineer for the Studebaker Corporation, has returned to that company and re-entered its engineering department. In the interim he was connected with Walter E. Flanders's Commercial Engineering Co. in Detroit.

Lambert Rims Removed to Detroit.

The American Rim Co., which manufactures the Lambert demountable rim, has completed the removal of its headquarters from New York City to Detroit, Mich., where it is located in the Sun Building. The New York office has been discontinued.

TWO ASSOCIATIONS MAY COMBINE

N. A. A. M. and Board of Trade Finally Make Definite Moves—Doings at N. A. A. M. Monthly Meeting.

That undercurrent of sentiment favoring but one national organization of automobile manufacturers, which first was openly voiced by W. E. Metzger, president of the National Association of Automobile Manufacturers in his annual report in January, took a definite direction at the regular monthly meeting of the association's executive committee, which was held in New York yesterday, 6th inst. The suggestion of the amalgamation of the N. A. A. M. and the Automobile Board of Trade was formally broached and fully discussed, the discussion leading to the appointment of a special committee, consisting of A. L. Pope, George W. Bennett and R. D. Chapin, who will confer with a similar committee appointed by the Board of Trade at its meeting yesterday.

Not all of those present at the meeting were favorable to the proposed amalgamation, but their objections were not very strenuous and in all likelihood will be overcome. It is known that a majority of the N. A. A. M. special committee is favorable to consolidation, and as they all are also members of the Board of Trade, there is every prospect that the amalgamation will be brought about.

The chief stumbling block is the patents controlled by the Board of Trade, but it is not improbable that a separate corporation may be formed to handle that department and thus leave the way unobstructed for the formation of one great organization of automobile manufacturers. The special committees of the two organizations probably will hold their first meeting next week.

At yesterday's meeting of the N. A. A. M. executive committee, all of the recommendations of the convention of commercial vehicle manufacturers, which was held under N. A. A. M. auspices on Monday and Tuesday, were adopted, excepting only the form of warranty. The executive committee believed it necessary to secure some additional legal advice on the subject, and for the purpose the recommendation in question was referred back to the commercial vehicle committee.

The subject of shows also was considered, and the likelihood that Madison Square Garden will be available for at least another year was remarked, at least informally, but pending the progress of the amalgamation movement no action bearing on the subject of show buildings was taken. It was decided, however, that the national shows of 1913 shall be held in New York during the two weeks commencing January 11th, and in Chicago from February 1st to

15th, the first week in each city being devoted to pleasure cars and the second week to commercial vehicles exactly as heretofore.

In line with its action of previous years, the N. A. A. M. executive committee voted an appropriation of \$1,500 in aid of the funds of the National Carriage Builders Technical School; \$5,000 to the general work of the American Automobile Association, and \$5,000 to the Good Roads fund of the same organization.

The standing committees appointed by President Metzger were submitted for approval, and promptly received it. They include one new committee, that on electric vehicles, the full list being as follows:

Commercial Vehicle Committee—S. D. Waldon, chairman; W. C. White, B. A. Gramm, Fred White.

Show Committee—H. O. Smith, chairman; A. L. Pope, W. C. Leland.

Legislative Committee—A. L. Pope, chairman; Benjamin Briscoe, Charles Clifton.

Committee on Contests and Demonstrations—Alfred Reeves, chairman; W. T. White, W. C. Leland.

Good Roads Committee—R. D. Chapin, chairman; S. D. Waldon.

Auditing Committee—Benjamin Briscoe, chairman; S. T. Davis, Jr., Charles Clifton.

Membership Committee—G. W. Bennett, chairman; L. H. Kittredge, S. T. Davis, Jr.

Traffic Committee—A. L. Pope, chairman; L. H. Kittredge, Hugh Chalmers.

Conference Committee—Alfred Reeves, chairman; A. L. Pope, R. D. Chapin.

Electric Vehicle Committee—H. H. Rice, chairman; W. C. Anderson, Fred White.

Those present at the meeting were as follows: W. E. Metzger, Charles Clifton, S. T. Davis, Jr., S. D. Waldon, H. O. Smith, H. H. Rice, A. L. Pope, L. H. Kittredge, R. D. Chapin, Alfred Reeves, W. C. Leland, G. W. Bennett, S. A. Miles, general manager. There were also present, as guests of the committee, C. C. Hanch and Colonel George Pope, of the Automobile Board of Trade.

Jury Gives Verdict for Body Builders.

A verdict for \$8,010.23, representing the sum of \$7,468.75 due on an order for 25 automobile bodies, plus costs and interest, was given by a jury in the New York Supreme Court on Wednesday, 28th ult., in favor of the Reading Metal Body Co., of Fleetwood, Pa., against the Palmer & Singer Mfg. Co., of New York. In its defense the Palmer & Singer company alleged that the Reading company had no authority to transact business in the State of New York, being a foreign corporation and not specifically admitted to do business therein, but judgment for the full amount was rendered, nevertheless. A second suit for \$793.25, alleged to be due on another order for bodies was dismissed by the court on a technical error, but is to be brought up again.

JANUARY EXPORTS HIT NEW MARK

Shipments During Month Attained a Total of Nearly \$2,500,000—United Kingdom Replaces Canada as Biggest Buyer.

In the matter of exports, the current year opened with more than a rush. The first month broke to smithereens all previous monthly records in actual and proportionate increases of exports of motor cars and parts, January accounting for the shipment of the unprecedented number of 2,047 complete cars, valued at \$1,955,290, and parts valued at \$472,601, as compared with 924 cars, valued at \$969,930, and parts valued at \$165,369 in January, 1911—an increase of 102 per cent, for the complete automobiles and 187 per cent, for parts. The total value of cars and parts exported during the first month of 1912 reached the high-water mark of \$2,427,891, an increase of \$1,292,592, or 114 per cent., over the figures of the corresponding month of 1911. The average value of the exported cars, however, dropped from \$1,049 in January, 1911, to \$955 in January, 1912.

As has been the case during recent months the increase has been confined to only six of the twelve geographical divisions, Great Britain and British Oceania showing the largest actual gains. Their purchases increased from \$194,589 and \$102,566 to \$508,324 and \$402,199, respectively. Heavy as these gains are they cannot compare with the enormous proportionate gains registered by Other Europe, which took \$106,801 worth, as against \$20,071 in January, 1911—an increase of 430 per cent.

The figures for the seven months ending January, 1912, reflect the great gains of the latter month, no less than 9,944 cars, valued at \$9,789,894, being sent abroad, as compared with 4,817 cars, valued at \$5,845,222, in the same period of the preceding year. Parts valued at \$2,080,299 were shipped, bringing the total of cars and parts to \$11,870,193—an increase of nearly \$5,000,000 over the \$6,908,346 in the corresponding period of the preceding year. The table in detail:

Keeton Company Organized in Detroit.

Forrest Keeton, who at one time was connected with the Croxton-Keeton Motor Co., of Masillon, O., has interested Detroit capital and organized the Keeton Motor Co., which has been incorporated with a nominal capital of \$10,000. In addition to Keeton, the stockholders are Wilber Brotherton, W. G. Houck, W. V. Moore and W. V. H. Moore and W. W. Wuchter. Wilber Brotherton is a member of the Jerome B. Rice Seed Co., and William V. Moore is fire commissioner of Detroit, both men having ample means and being highly regarded. The new company will build a four-cylinder car of the Renault type, which largely will resemble the Croxton-Keeton model, but which will include a number of improvements and refinements.

Weed Enjoins the Atlas Chain Grip.

In the United States District Court for the Southern District of New York, Judge Lacombe on Tuesday, 5th inst., granted the application of the Weed Chain Tire Grip Co. for a preliminary injunction restraining the Atlas Chain Co. from in any way infringing the Weed patents. The argument for the preliminary injunction was unusually full and led the court to hand down an opinion of some length.

Bennett Again Takes Up His Duties.

Having found his voice in Florida, George W. Bennett, vice-president and general sales manager of the Willys-Overland Co., returned to his duties on Tuesday last. While the Florida climate overcame the paralysis of his vocal chords, Bennett's throat is not entirely well, but the return of his power of speech was so welcome that the lingering throat trouble is causing him no concern.

Slight Drop in January's Tire Exports.

Shipments of American-made automobile tires decreased slightly during the month of January, 1912, the figures being \$161,337 as compared with \$175,743 in the same month of 1911. During the seven months ended January, 1912, however, there were exported \$1,374,337 worth of tires, as against \$1,015,673 during the same period of the preceding year.

TRUCK MAKERS DISCUSS PROBLEMS

Under Auspices of N. A. A. M., They Hold Two Days Convention—Guarantee and Other Things Recommended.

In an effort to solve some of the more pressing problems that confront manufacturers of commercial motor vehicles—such as the form of guarantees, the limits to be placed on demonstrations, and the like—and to further the standardization of motor trucks of different makes, a meeting of representatives of prominent makers of commercial vehicles, some 40 in number, was held on Monday and Tuesday last, March 4th and 5th, in the offices of the National Association of Automobile Manufacturers in New York, the meeting having been called by the commercial vehicle committee of the association with a view to obtaining the opinions not merely of its members but of the whole trade, on the subjects scheduled for discussion. As a result of the deliberations, a form of standard warranty was drawn up and its adoption recommended, and a resolution was passed recommending the adoption of the S. A. E. standard of dimensional tolerance for felloe bands—a standard limit of oversize and undersize dimensions—with the object of securing greater uniformity of size and interchangeability of felloe bands and so avoiding the inconvenience that results from the use of felloe bands that are very much under or over size and so are anything but interchangeable.

Following an address of welcome by W. E. Metzger, president of the N. A. A. M., and an informal talk dealing with trade conditions by Charles Clifton, president of the Automobile Board of Trade, S. D. Waldon, of the Packard Motor Car Co., who presided over the meeting, called the gathering to order. A general discussion of various trade topics was followed by the adoption of resolutions recommending that the N. A. A. M. adopt uniform maximum speed ratings for motor trucks of various load capacities, and uniform weight allowances for the simplest forms of bodies

	January				Seven months ending January			
	1911	1912	1911	1912	1910	1911	1912	1912
Automobiles and parts of—	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Automobiles	924	\$969,930	2,047	\$1,955,290	2,868	\$3,795,952	4,817	\$5,845,222
Exported to—								
United Kingdom		194,589		719		1,060,464		1,177,625
France		31,342		20		318,270		246,546
Germany		3,731		15		104,515		158,467
Italy		30,000		12		25,761		81,927
Other Europe		20,071		119		132,553		347,798
Canada		439,706		404		1,627,804		2,435,955
Mexico		56,043		46		292,013		449,708
West Indies and Bermuda...		61,788		20		248,932		241,184
South America		85,413		187		170,979		411,967
British Oceania		102,566		402		259,626		720,058
Asia and other Oceania.....		73,583		65		168,976		475,636
Other countries		35,467		38		81,668		161,475
Parts of (except tires).....		165,369		472,601		695,609		1,063,124
Total		\$1,135,299		\$2,427,891		\$4,491,561		\$6,908,346
								\$11,870,193

regularly catalogued by the manufacturers. The figures are as follows:

Capacity, Tons.	Miles Per Hour.	Weight of Body.
1/2.....	16	500
1.....	15	600
1 1/2.....	14	700
2.....	13	800
2 1/2.....	12	900
3.....	11	1,000
3 1/2.....	10 1/2	1,100
4.....	10	1,200
4 1/2.....	9 1/2	1,300
5.....	9	1,400
6.....	8	1,600
7.....	7	1,800
8.....	6	2,000
9.....	5 1/2	2,200
10.....	5	2,400

Then came up the time-worn yet ever fresh, question of overloads, and a discussion ensued as to whether or not it would be advisable to adopt a standard allowance for occasional overloads. Evidently the manufacturers had had experiences unfavorable to allowing excess loading, for in the end it was resolved that "in the opinion of the meeting it is inadvisable to encourage the belief that a truck is designed to carry any weight in excess of its rated capacity, or to permit a warranty to apply to any truck which is overloaded." Further, it was recommended that a standard plate be prepared, to be attached to the chassis, unmistakably setting forth the rated capacity of the machine and a warning to the effect that overloading must not be indulged in.

Another moot question that received its share of attention was that of making demonstrations for prospective purchasers of trucks. There was no little discussion as to the advisability of charging for work done during demonstrations and the rates at which such charges should be made. While it was the consensus of opinion of the manufacturers present that some such charge should be made, and that the amount should be refunded in case of the purchase of the truck, no scale of charges was decided upon, and no definite action taken.

Definite action was taken, however, in the matter of a standard warranty upon commercial motor vehicles, and a form was recommended to the executive committee of the N. A. A. M. for adoption. The proposed warranty follows:

We warrant the new motor trucks manufactured by us for ninety days after the date of delivery to purchaser, this warranty being limited to the furnishing, in our factory, of such part or parts of the motor truck as shall, under normal use, appear to us to be defective in material or workmanship.

This warranty is limited to the shipment to the purchaser, without charge, except for transportation, of the part or parts intended to replace the part or parts which, upon their return to us at our factory for inspection, we shall have determined were defective, and provided the transportation charges for the part or parts so returned have been prepaid; and, provided further, that the said failure of said part or parts is shown not to be due to abnormal use, misuse, neglect or accident, occurring after

such motor truck shall have been shipped to the purchaser.

We make no warranty whatever in respect to tires, rims, ignition apparatus, lamps, gas tanks, signaling devices, generators or other trade accessories, inasmuch as the same are usually warranted separately by their respective manufacturers.

The condition of this warranty is such that if the motor truck to which it applies is altered or repaired outside our factory, or if it is operated at a speed in excess of its factory rated speed, or if it is loaded beyond its factory rated load capacity, then this warranty shall become null and void and our liability under it shall cease.

The number of the motor truck to which this warranty shall apply is, and is described as

Following the general tendency of the trade toward standardization, the meeting decided to place a limit on permissible dimensional variations in felloe bands, and with this end in view strongly recommended the adoption by the N. A. A. M. of the tolerance limit adopted by a technical committee of the Society of Automobile Engineers. These tolerances, which are set forth in the S. A. E. technical committee's report for February, 1912, are as follows:

(1) Tolerance in circumference of felloe band shall be as follows:

	Plus.	Minus.
Before application to wheel.	1/32"	1/32"
After application to wheel..	1/16"	1/32"

Variation from precise measurement shall be uniform over entire width of band.

(This modifies our recommendation in report accepted at the June, 1911. meeting of the society, to meet the requirements of the more extensive manufacture of rigid base tires.)

	Plus.	Minus.
Up to and including 4".....	1/32"	1/32"
4 1/16" to 6".....	3/64"	3/64"
6 1/16" to 12".....	1/16"	1/16"

(3) Variation in trueness of band when placed on surface plate:

Band shall touch all over at points within 1/32" up to and including 6" width; over 6" width, within 1/16".

(4) Variation in thickness of band: 0.006", plus or minus.

(5) Trueness to round. The radical tolerance on the wheel when felloe band is applied shall be 1/16", plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

With an eye to the future, resolutions were passed recommending that the commercial vehicle committee of the N. A. A. M. continue its work of securing data concerning the dimensions of chassis frames back of the driver's seat, the idea being to collect information that may prove of future use in the standardization of bodies of trucks of similar carrying capacities but of different makes. A resolution also was passed recommending the securing of data in regard to wheel diameters, heights of truck frames and platforms, and heights of railroad cars and loading platforms.

The meeting recommended that the committee obtain and classify information with regard to tire mileage in cities having widely differing street conditions, both as to the condition of the street surfaces and

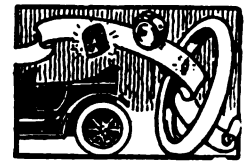
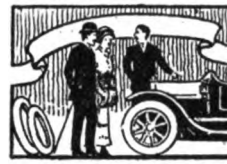
the topography of the country. S. D. Waldon's explanation of the Packard company's system of price reduction in cases where trucks were purchased in lots of from two to fifty brought out the information that plans of a similar character have been adopted by one or two other manufacturers of trucks.

Delivery delays in Chicago due to the congestion of traffic in the streets and alleys of that city were made the subject of a talk by D. Beecroft, who suggested that advantageous changes might be effected by co-operation between manufacturers and commercial bodies, architects and other interests. Receiving departments in all office buildings and other conveniences were mentioned as aids to quick unloading and immediate departure of vehicles after unloading.

Incidental to the gathering a paper on truck tires was read by S. V. Norton, of the B. F. Goodrich Co., and one on maintenance guarantees by W. P. Kennedy.

Other meetings of the manufacturers will be held June 4th next and on November 7th. Those in attendance at this week's session were:

S. D. Waldon, Packard Motor Car Co. (presiding); W. E. Metzger, Metzger Motor Car Co. and Everitt Motor Car Co.; Charles Clifton, Pierce-Arrow Motor Car Co.; Benjamin Briscoe, United States Motor Co.; B. A. Gramm, Gramm Motor Truck Co.; F. I. Harding, Peerless Motor Car Co.; H. Kerr Thomas, Pierce-Arrow Motor Car Co.; J. J. Somis, Speedwell Motor Car Co.; Vincent Link, Universal Motor Truck Co.; M. T. Pilcher, Federal Motor Truck Co.; Albert L. Pope, Pope Mfg. Co.; W. C. Walker, Pope Mfg. Co.; C. E. Stone, Gramm Motor Truck Co.; P. K. Hexter, Gramm Motor Truck Co.; A. M. Chase, Chase Motor Truck Co.; F. O. Sutton, Knox Automobile Co.; A. W. Robinson, Locomobile Co. of America; A. J. Doty, the Lansden Co.; Will H. Brown, Mais Motor Truck Co.; Walter C. White, the White Co.; H. F. Flowers, American Locomotive Co.; Peter Dumont, Baker Motor Vehicle Co.; H. S. Diller, Lauth-Jurgens Motor Car Co.; Morris Grabowsky, Alden Sampson Mfg. Co.; H. S. Stebbins, General Motors Truck Co.; C. H. Wallerich, General Industrial & Mfg. Co.; Herbert G. Streat, Knickerbocker Motor Truck Mfg. Co.; F. F. Lewis, Knickerbocker Motor Truck Mfg. Co.; J. T. Langhorne, Packard Motor Car Co.; E. W. Curtis, Jr., General Vehicle Co.; Wm. P. Kennedy, American Locomotive Co. and Baker Motor Vehicle Co.; F. Nelson Carle, General Vehicle Co.; Alfred Reeves, United States Motor Co.; D. Beecroft Class Journal Co.; S. V. Norton, B. F. Goodrich Co.; C. W. Fletcher, Walter Motor Truck Co.; G. A. Hodges, International Motor Co.; David S. Ludlum, the Autocar Co.; George H. Kelly, Baker Motor Vehicle Co.; H. E. Coffin, Hudson Motor Car Co.; R. D. Chapin, Hudson Motor Car Co.



J. J. Blake, of Lake Charles, La., has opened a garage at 108 Ryan street.

The Fairbury Automobile Co., of Fairbury, Ill., has filed formal notice of dissolution.

John N. Dondelinger is remodeling the Volk building in St. Peter, Minn., into a garage.

Albert Walthers and John Helzer are preparing to open a garage and salesroom in Palmer, Neb.

George Gray has purchased the interest of N. B. Walker in the San Jacinto Valley Garage, San Jacinto, Cal.

The Judith Auto Co. has been formed at Philbrook, Mont. Olaf Noren and Spencer Newell are the proprietors.

The Burns Implement Co. has been formed at Moneta, Ia., to deal in automobiles, buggies and agricultural implements.

At a cost of \$7,000 John C. Winters is building a reinforced concrete garage at Montesano, Wash., which will be 50 x 120 feet.

Ed. Roller has purchased an interest in the Shoemaker Garage, Murdo, S. D., and the business hereafter will be styled Shoemaker & Co.

The Midwest Auto Co. has "opened up" at Benkelman, Neb., with Kelly & Evans as its owners. They will handle E-M-F and Flanders cars.

Milo Ball, of Iowa Point, has purchased the business of the Johnson Garage at Highland, Kans., and will operate it under his own name.

C. A. Stroman, J. M. Zeigler and N. T. Zeigler have formed the Carolina Motor Co., and are about to open a garage in Orangeburg, S. C.

The Dwyer & Roche Co. is a new concern in Hartford, Conn., with a garage at 18 John street. General repairing and garage work will be handled.

Hiram Weaver, of Portsmouth, N. H., has opened salesrooms in the Sherry block at Central avenue, Dover, N. H., where he will show Ford cars.

Salesrooms have been opened in the Empire building, Birmingham, Ala., by the Great Southern Automobile Co., of which W. O. Fields is the manager.

Roy Dodge has purchased the blacksmith shop of Glenn Fales, Caledonia Mich., and will remodel it into a garage. He handles the Ford line of cars.

The Brudewold Brothers' Garage, of Page, N. D., is being moved to Pillsbury, in the same State, where the business will be conducted under the same style.

C. P. H. Root, who operates a garage at Portland, Ore., has added trucks to his renting and repairing business. He will feature the Lippard-Stewart vehicles.

Summers & Nye is the style of a new firm which has taken over the business of Hand & Woodard, Shenandoah, Ia. They will conduct a garage and repair shop.

F. A. Lattig, formerly of Laredo, Tex., has purchased the garage and supply business of T. D. Wilson, at 715 Mesquite street, Corpus Christi, in the same State.

Bob Russell and W. L. Graves have formed a partnership and opened a garage at 902 Austin avenue, in the building formerly occupied by the Centex Motor Co., Waco, Tex.

Earl Chambers, who has been handling Velie cars for the past three years in Danville, Ill., has discontinued his business. He has joined the sales staff of the Chicago Velie branch.

A. R. Castle, one of the partners in the Hettinger Motor Co., of Hettinger, N. D., has sold his interest to his partner, John A. Winkel, who will continue the business under the old style.

Joseph G. Snow has obtained a permit for a garage to be erected at the corner of Belmont street and Warren avenue, Brockton, Mass. It will be of brick, one story high, 110 x 129 feet.

The Independent Implement Co., of Owatonna, Minn., following the example of many other agricultural implement concerns, has taken on automobiles; it will handle Cadillac cars.

Salesrooms have been opened at 437-453 West Main street, Little Falls, N. Y., by John A. Cooney. He has the agency for Abbott-Detroit, Marion and Selden gasoline cars, and Baker electrics.

G. E. Holmes and A. V. Curry have formed the Veerac Sales Co. and opened salesrooms at 1790 University avenue, St. Paul, Minn. As the name implies, they will feature Veerac trucks exclusively.

Harry E. Borden, who operated a salesroom and garage at 11 Ash street, New Bedford, Mass., has filed a petition in voluntary bankruptcy. He places his liabilities at \$5,305 and his assets at \$293.

R. H. Lincoln, a lawyer, of Medford, Ore., has purchased an interest in the Bear Creek Motor Car Co. in that city and become assistant manager. The company handles Buick and Cadillac cars in the Medford district.

Albert H. Lohrman and John F. Lohrman have formed the Cole Motor Sales

Co. to handle the Cole car in Cincinnati. Charles Schuster, formerly sales manager for the Cadillac agency in Cincinnati, has become sales manager for the new Cole concern.

The Drury-Wells Co., which has the Ohio State agency for Marathon cars, disposed of their Youngstown business to F. M. Keir and W. D. Welch, who will do business as the Marathon Sales Co. The headquarters of the new company will be at 9 Ridge avenue.

William Ernst and C. J. Lamb have formed the Elmore Repair Works and located at 1227 Sprague avenue, Spokane, Wash. They have taken over the stock of Stanley W. Smith, formerly the Elmore agent for Spokane, and will handle Elmore cars in the "Inland Empire."

Under the style the R-C-H Spokane Co., a company has been formed in that Washington city to distribute the R-C-H car in eastern Washington, western Montana and northern Iowa. N. D. McIvor, of the Commercial Garage Co., is manager of the new concern, which will have its headquarters at 221 Pacific avenue.

Two new concerns have been added to the roster of automobile dealers in Toledo, Ohio. One of these is the Northern Ohio Punctureless Tire Co., which has opened a Toledo branch at 1017 Jefferson avenue, with Lewis Nieset and F. E. Nieset, as president and manager, respectively. The other is the National Motor Sales Co., which has opened salesrooms on Madison avenue, where it will show National cars.

Recent Losses by Fire.

Carbondale, Ill.—Kane Garage, North Ninth street, damaged by fire.

Quebec, Can.—Bourassa's Garage, 28 Visitation street, and one car burned. Loss, \$3,000.

Walkersville, Ont.—A. O. Janisse's automobile supply shop; destroyed. Loss, \$3,000.

Petaluma, Cal.—Oakland Taxicab's Co.'s garage and four automobiles destroyed. Loss, \$25,000.

Washington, D. C.—David S. Hendrick's salesroom, 1317 H street, N. W., and five cars burned. Loss, \$10,000.

Detroit, Mich.—Charles Berdan's Broadway Auto Garage and 20 cars badly damaged. Loss estimated at \$25,000.

New York City—Republic Rubber Tire and Shoe Co. and New York Coach and Automobile Lamp Co., 764-768 Tenth avenue; badly damaged.

DORIAN INVOLVED IN BANK FAILURE

Embarrassment of Its Officers Seriously Interferes With Prospects—Big Sums Required to Develop Rims.

Due to the entanglement of a chain of private banks owned by Moritz and Max Rosett, the Dorian Remountable Rim Co., of New York, of which they are officers and chief stockholders, has been placed in a plight which, according to Frederick F. Neuman, their attorney, may lead to the filing of a voluntary petition for a receiver.

In addition to the two banks maintained in New York City, the Rosetts conducted similar institutions in Jersey City and Perth Amboy, N. J.; Wilkes-Barre, Pa., and Youngstown, Ohio, all of them being patronized by working people and foreigners of the humbler class. A sudden run on the New York banks led to the filing of an involuntary petition in bankruptcy, which was followed by the appointment of Joseph M. Conklin, a New Jersey bank examiner, as United States receiver.

Previous to the bankruptcy proceedings, Conklin, in his capacity as bank examiner, had investigated the condition of the Rosett banks and found loans and discounts to the Dorian Remountable Rim Co. to the amount of \$158,194, which conveys some idea of the capital required to develop and place on the market even a demountable rim, the Dorian company, after long effort, having just about reached the turn in the long lane which leads to success.

Moritz Rosett, the older member of the firm, has been in the private banking business for 30 years, and is now 70 years of age. He is president of the Dorian Remountable Rim Co., of which Max Rosett is vice-president. Their present embarrassment is ascribed to bad judgment in making loans.

Creditors' Support for the Detroit Wagon.

Too much business to be wielded by its working capital brought about a meeting of the merchandise creditors of the Motor Wagon Co., of Detroit, on Friday last, 1st instant, at which time about six-sevenths of the creditors in amount were represented. The company disclosed its condition and it is almost certain that an extension which will permit it to weather the storm will be granted.

After a full discussion of its affairs, the creditors practically unanimously agreed that it would be to their best interests to accept the proposition offered, and a committee, consisting of C. W. Shipley, of the Highland Body Co., Cincinnati; H. R. McMahon, of the Liggitt Spring & Axle Co., Pittsburg, and Frank W. Blair, of the Barr Mfg. Co., Detroit, the three largest creditors, was appointed to put the settlement

proposition in satisfactory shape and to secure the signatures of all merchandise creditors. Since that time creditors representing about 70 per cent. of the claims in amount have signed the agreement, or signified their intention of doing so. As the Motor Wagon Co. has orders in hand for a substantial number of cars, and prospects for several hundred more, General Manager Burch believes that the present troubles will quickly blow over and operations be continued as actively as ever.

Suit Involving Magneto Bearings Only.

The suit of the Norma Co. of America against the J. S. Bretz Co., of New York, importers of the F. & S. ball bearings, is not nearly so formidable as the complaint in the case made appear. The patents in dispute—Nos. 744,437 and 796,648—apply not to the F. & S. wheel and engine bearings, but solely to those which are employed in the F. & S. magneto, and of the latter the Bretz company imports but very limited quantities. The infringement of the trade mark "Norma" by the Bretz company, which also forms a part of the complaint, was wholly unintentional, and was due to rather unusual circumstances. It appears that Fichtel & Sachs, who manufacture the F. & S. bearings and magnetos, operate under a working agreement with the Norma company of Germany, and that their magneto bearings at least are inconspicuously branded with the name "Norma." Inadvertently some of these bearings were shipped to America and were used by the Bretz company, the brand name escaping notice. According to W. A. Redding, counsel for the J. S. Bretz Co., the defendants very willingly will consent to the issuance of an injunction restraining their use of the name "Norma" in this country, as they have no desire whatsoever to use it in any way.

To Reorganize "Clink of Gold" Company.

According to present plans, the Jonz car will be saved. The American Automobile Mfg. Co., which was formed to bring it from Beatrice, Neb., to New Albany, Ind., and which conducted the famous "clink of gold" stock-selling campaign that led to the appointment of a receiver last month, probably will be reorganized under the title American Automobile Corporation. At any rate, representatives of 75 per cent. of the 9,000 stockholders who fancied they heard the "clink of gold" and purchased the \$5 shares, held a meeting in New Albany on Thursday last, at which time a committee of ten was appointed to organize the American Automobile Corporation, capitalized at \$250,000, which it is proposed shall take over the stock of the old concern. Those \$5 shareholders who heard the "clink" but who saw none of the gold, and who filed claims aggregating \$30,000, it is stated, will receive 40 per cent. of their claims—in stock certificates of the new corporation.

HEWITT ENTERS THE INTERNATIONAL

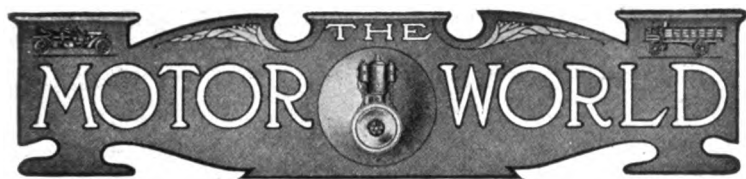
But Recently Separated from Metzger, It Joins the Mack and Saurer Interests—Factory to be Continued.

Confirming rumors which have been afloat for several weeks, the International Motor Co., of New York, last week acquired and took over the property and business of the Hewitt Motor Co., of New York, the amalgamation dating from March first. The Hewitt executive offices and sales departments have been merged with those of the International Motor Co., but the Hewitt plant, in New York City, will be continued, together with the Mack factory in Allentown, Pa., and the Saurer factory, in Plainfield, N. J., around both of which the International Motor Co. was formed last year.

In some directions the transaction caused surprise, as only three months ago the Hewitt interests, which had been acquired two years before by the Metzger Motor Car Co., of Detroit, were separated therefrom and reverted to Edwin R. Hewitt, who organized the present Hewitt Motor Co., with \$1,000,000 capital. At that time W. E. Corey, one-time president of the Steel Trust; F. C. Converse, the New York banker, and several other millionaires became directors of the company, and as other men well known in the financial district of New York are prominent in the affairs of the International organization, the surprise is not so widespread as might be the case.

Imports Gain Strength in January.

As was the case with the exports during the month of January, the imports of cars took an upward bound. There were brought to this country during the month 84 cars, valued at \$199,197, as compared with 69 cars valued at \$137,727, in the same month of the preceding year. Parts to the value of \$25,145 were imported, bringing the total for cars and parts to \$224,342, as against \$171,301 in January, 1911. Reflecting the upward tendency of the past few months, the import figures for the seven months ending January, 1912, for the first time in four years show a gain over figures for corresponding periods of preceding years. During the seven months ending with January, 1912, there were imported into this country 644 cars, valued at \$1,406,328, and parts valued at \$182,951, as compared with 545 cars, valued at \$1,145,220, and parts valued at \$195,529, in the same period ending January, 1911. France still leads with \$545,596, followed by the United Kingdom (\$292,576). Other Countries (\$216,331). Germany (\$204,182) and Italy (\$147,643), in the order named. With the exception of Italy every division increased its purchases over those of the preceding year.



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INSTALLATIONS THAT MAKE FOR MISCHIEF.

It is only one of the advantages of the many dynamo electric car lighting systems which are on the market that in the majority of cases they may be quickly and easily made part of a car without the necessity for disturbing other elements and without the use of special tools and appliances other than those supplied by the manufacturer. This is a great advantage, of course, and one which accounts in no small measure for the popularity and increasing use of such modern conveniences—or rather necessities, if judged from the angle of the prospective purchaser—but their very ease of attachment, and the proclivity of the average owner to consider himself proficient in most of the arts of the automobile engineer, makes possible the commission of a grave fault.

For instance there may be seen any number of dynamos mounted on brackets on the engine crankcase and arranged to be operated through gearing from the pump shaft, the plan showing only too plainly the handiwork of amateurs—the word gearing in this case meaning either gear wheels or a belt or a chain, as the case may be. Where the pump shaft is short and amply braced in liberal bearings, such an arrangement is simple and effective. But where the shaft is comparatively long and the dynamo is so located that the drive is taken practically from the middle of the shaft, it scarcely can escape notice that there must be some effect on the shaft bearings and that it cannot be a good effect.

The exact amount of power consumed by a lighting dynamo is dependent on a great number of factors, and it is impossible to generalize and state that the average consumption is one-eighth or one-sixteenth or one-quarter horsepower. By way of empha-

sizing that more power than generally supposed is used, however, it might be added that one well-known dynamo operating at normal speed requires one-seventh horsepower. But while these amounts almost are infinitesimal as compared with the output of the car engine, and in this connection may be disregarded entirely as of no importance, it may be appreciated that even so small an amount of power transmitted through a comparatively light, long shaft, supported only at its extremities, must cause a certain amount of bending strain in the shaft. What the ultimate result on the bearings may be it is difficult to judge, though it is plain that they cannot wear as long or as satisfactorily as would be the case if proper provision for driving the dynamo were made.

There are any number of better methods of driving lighting dynamos, and it would appear to the advantage of the car manufacturer and the manufacturer of the lighting system to warn against improper installations and to point out the evils which must of necessity follow, unless proper precautions to obtain both a suitable method of mounting the dynamo and a suitable method of driving it carefully are sought out.

SUPPRESSING THE MUFFLER CUT-OUT.

If there is any one pernicious practice that the driver of a motor car can indulge in with less excuse than another, it is the indiscriminate use of the muffler cut-out, and the attitude that civic authorities are assuming in the matter in various parts of the country is wholly justified. There is a spreading inclination to regard a noisy exhaust as a public nuisance—which it undoubtedly is—and to legislate against it accordingly. In many places prohibitions already are in force, but strangely enough, in the larger cities, where the cut-out is most a nuisance, its use still is countenanced. London, however, finally has enacted a prohibitory ordinance, and in New York the cry now is going up for a similar enactment.

It is to be hoped that the cry will be heeded. For as a matter of fact, if every exhaust cut-out in the universe were permanently closed there would be little inconvenience caused—in fact, so far as the better cars of today are concerned, it would be no hardship at all, for mufflers now are made so efficient that the back pressure they cause is a negligible amount—so slight that it is practically impossible to detect any increase in the power developed by the motor, even on a hard pull up a grade, when the cut-out is opened. Nevertheless it is a common thing for the driver of a car—and somehow the drivers of big powered machines seem to be in the class of worst offenders in this respect—to let his motor exhaust direct into the air even when running on level roads, making a nerve-racking racket that is not excusable because it serves no useful end.

While the suppression of the exhaust cut-out must be considered a good thing from the point of view of alleviating the sufferings of those who, perforce, listen to the noise in the streets, there is another side to the matter that conveys its own moral. Though the better cars have mufflers that are not only extremely efficient as silencers of the exhaust but are practically without back pressure, there still are mufflers made that are not all they should be in these respects. There has been no concerted effort on the part of manufacturers to improve this important detail, as there has in regard to most other motor car parts, and the time has come for such action. The muffler cut-out is the salvation of the inefficient muffler, and its general use may explain but does not excuse its employment.

PROTESTS AGAINST LOWER DUTIES

Bearing and Chain Manufacturers File Objections With Congress—Facts and Figures Brought to Bear.

If the proposed reduction in the duty affecting steel balls, ball bearings and roller bearings from 45 to 25 per cent., which is provided for in the new steel schedule, which already has passed the lower house of Congress, is enacted, the American manufacturers of those articles are agreed that they will be seriously crippled, if not wiped out. They have so informed the finance committee of the United States Senate in a brief presented in behalf of the New Departure Mfg. Co., the Timken Roller Bearing Co., the Hyatt Roller Bearing Co. and others, which brief the committee now is considering.

In presenting their protest, these manufacturers pointed out that "the foreign manufacturers—of whom but three were represented in this country two years ago, whereas now more than twelve find this an attractive market—supply one-third of the American demand and at a satisfactory profit, or the trade would not continue, without the maintenance of any plant or equipment whatsoever, and without employing a single dollar's worth of American labor or the use of a single dollar's worth of American material," and that "the best possible evidence of our inability to stand any reduction is that one-third of the total American consumption is even now in the hands of foreign manufacturers, and that unless we are properly protected the entire business is likely to pass to them."

At the present time it is estimated that there is invested in this country in the manufacture of anti-friction bearings about \$9,000,000, of which at least \$3,000,000 is represented by special apparatus, and that the various manufacturers employ, collectively, between five and six thousand persons, the characters of the productions calling for the "highest development of scientific handling of both labor and material," the labor costing at least two and one-third times more than is the case in Germany and about twice as much as in England.

The total domestic consumption of anti-friction bearings is estimated at between eight and one-half and nine million dollars, sale of imported bearings at American prices.

The proposed reduction in the tariff rate, according to the brief presented by the American manufacturers, will make it possible for the foreign manufacturer to reduce his price in this country about 15 per cent., which reduction it would be "impossible for the American manufacturer to meet and to continue business."

"Any change in our present relation to

foreign competition affects the stability of our business in the future, and jeopardizes several years' returns on capital already invested, which capital we were led to invest on the basis of the present tariff rate," say the protesting manufacturers.

The American manufacturers of chains also have voiced a protest against the proposed reduction in the duty on imported chains. Indeed, they have asked the Senate Finance Committee to add 5 per cent. to the present 45 per cent., instead of reducing it to 20 per cent.

L. M. Wainwright, president of the Diamond Chain & Mfg. Co., of Indianapolis, voiced the chain makers' protest, in which the Whitney Mfg. Co., the Duckworth Chain & Mfg. Co., the Lefever Arms Co. and the Link Belt Co. joined. They pointed out the great difference which prevails in the price of labor here and abroad; remarked that the manufacture of roller chains is comparatively new, and, therefore, requires fresh and great investment; maintained that under the present duty "it is possible, and that in practice the foreign makers sell his product with profit, delivered in New York, at prices equal to or less than the American cost of production, which condition will continue for many years," whereas the American manufacturer has not been able to sell his product in Great Britain or in Europe because his costs will not permit him to compete.

The reduction in the duty, it is stated, would be disastrous to all makers of sprocket chains in the United States, even the present quantity selling price being "below a safe point," due to foreign competition in this country.

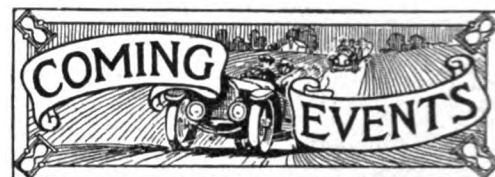
In presenting their argument, the American makers also urged that federal officials make closer investigation to prevent undervaluation by the foreign makers, which, it is stated, seems to be the practice.

Car Makers Also Oppose Tariff-Tinkering.

The automobile manufacturers also have joined in the protest against the proposed tariff reductions, which in the case of automobiles would lower the import duty from 45 to 40 per cent. Charles Clifton (Pierce-Arrow) and W. C. Leland (Cadillac), whose companies are members of both the National Association of Automobile Manufacturers and the Automobile Board of Trade, have been delegated to appear before the Senate Finance Committee, to present arguments why the proposed tariff-tinkering should be checked and the duty on automobiles be left at the present rate.

S. A. E. Branch Formed in Indianapolis.

Following the example set by the members of the organization in New York, Philadelphia and Detroit, the Indianapolis tradesmen who are on the roll of the Society of Automobile Engineers have organized an Indiana branch of that body with W. G. Wall, of the National Motor Vehicle Co., as president. The other offi-



March 2-9, Columbus, Ohio—Columbus Automobile Club's show in the old post office building.

March 2-9, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure vehicles only.

March 4-9, Montgomery, Ala.—Alabama Automobile Association's track race.

March 6-9, Louisville, Ky.—Fifth annual show under the auspices of the Louisville Automobile Dealers' Association.

March 12-16, Denver, Colo.—Annual show in the Denver Auditorium under the auspices of the Automobile Dealers' Association.

March 12-16, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fourth annual show in the State Armory.

March 13-20, Boston, Mass.—Boston Commercial Vehicle Association's show in Mechanics' Hall.

March 17, San Jose, Cal.—Track race under the auspices of Emile Agraz and W. T. Buehren.

March 25-30, Indianapolis, Ind.—Indianapolis Automobile Trade Association's first annual show in a tent auditorium covering University Park Square.

April 6-13, Ottawa, Can.—First annual show of the Ottawa Valley Motor Car Association in Howich Hall.

April 29-May 4, Burlington, Vt.—Burlington Merchants' Protective Association's annual show in State Armory.

May 4, Santa Monica, Cal.—Santa Monica road race.

May 14-17, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

May 30, Indianapolis, Ind.—Five hundred miles International Sweepstakes race on the speedway.

May 30, Salem, N. H.—Rockingham Park track race.

June 20, Chicago, Ill.—Chicago Motor Club's annual hill climbing contests on Algonquin Hill.

August 8-10, Galveston, Tex.—Galveston Auto Club's race meet on Galveston Beach.

cers are: C. S. Ricker, vice-president; Charles S. Crawford, of the Cole Motor Car Co., secretary; and George A. Weidely, of the Premier Motor Mfg. Co., treasurer. Howard Marmon, of the Nordyke & Marmon Co., is chairman of the membership committee; F. E. Moskovics, of the Remy Electric Co., chairman of the papers committee, and C. S. Ricker, chairman of the publicity committee.

BOSTON SHOW BEARS OUT PROMOTERS' PROMISE

It is Beautiful to Look Upon and Eleventh Hour Arrivals Provide More Previously Unexhibited Cars Than Ever Before—New Sleeve-Valve Engine and Several New Engine Starters, Not to Mention Two Spring Tires, Crop Out in Accessory Department.



LOOKING DOWN THE MAIN AISLE IN EXHIBITION HALL AND SHOWING THE ENGLISH ESTATE EFFECTS

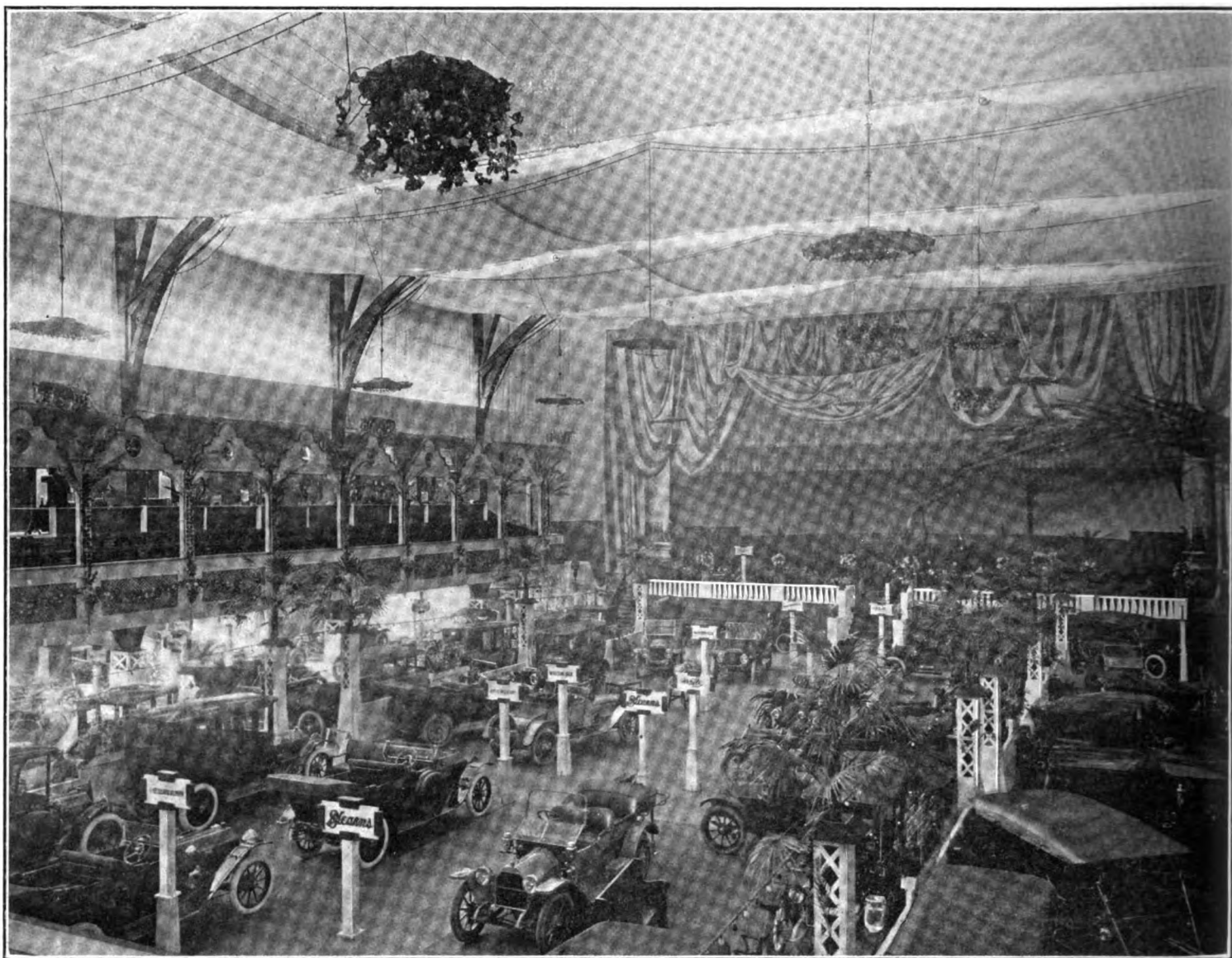
Boston kept its promise; in fact, more than kept it. It has presented and will present for the remainder of this week—and part of next week, when the trucks take possession of Mechanics' Building—a show that, decoratively speaking, truly is beautiful to look upon; and though advance sheets made it appear that there would be exhibited but three cars which had not been exhibited at either of the national shows, the eleventh-hour rush for space increased the number to eleven.

Not including the exhibits of dictionaries, coffee pots, ladies' combs or the life insurance policies which dot the scene, the display of unknown or little known accessories is larger and richer than usual.

Among other things it brought to light Miss Margaret E. Knight's sleeve valve engine, which, from more than a mechanical standpoint, may make history in the automobile industry, and for the first time also there are being introduced the three newest members of the growing engine starter family, the Cox "Crankless" starter and the B. & S. starter, both of the acetylene type, and the Tudor, a starter of the spring actuated or mechanical type; of smaller conveniences there is no lack. They all are placed in settings such as characterized none of Boston's nine previous shows—and Boston has had some mighty nifty settings, too—and which it is doubtful have been excelled by any of the national shows ever

held in New York or Chicago. Boston's show is as large as either of those other annual functions, but, coming so long after them, it lacks their importance. But it is far too big and too important to be placed in the category of purely local shows; the New England show is the designation which most fittingly describes it.

Mechanics' Building, in which the exhibition is housed, comprises two great connecting halls—Exhibition Hall and Grand Hall—the one a large, "loose" low-ceilinged apartment, with naked posts and beams; the other, Grand Hall, a smaller but much loftier and more parlorlike place, suggestive of auditoriums. In preparation for the annual show, the decorative hand has found



GENERAL VIEW OF EXHIBITS AND SPANISH MISSION DECORATIONS IN GRAND HALL

Grand Hall an easy subject for treatment and Exhibition Hall a trying one.

Perforce, the latter, so to speak, has been the soup of the show; Grand Hall the dessert. Until this year there never was a question which was the greater treat for the eye. This time, however, the interrogation is there and looms large. For Exhibition Hall, which one enters first, is literally as pretty as a picture; indeed, it is a picture. They say it represents an English country estate, and perhaps it does; and that Grand Hall represents a page from the text-books as they were "writ" or sketched by the Spanish mission architects, and, again, perhaps it does—but it is necessary to stop, look, listen, whistle and rub the eyes before either the English estate or the Spanish mission idea sinks home. It is there plain enough, but it is necessary to inhale or absorb the idea, as it were.

By any other names they'd look as stunning; and they are stunningly handsome. Exhibition Hall looks as much like a rose garden as anything else, and Grand Hall

possesses the Spanish mission flavor, but somehow snow-white arches and blood-red bells are not too suggestive of sunbaked adobe and weather-worn bronze.

Before the cars were placed in position the English estate effect undoubtedly was easier to grasp. The painted landscape which conceals the walls and which then was plain to be seen over a "garden wall" of box hedge which forms the base of the picture, is, however, almost hidden by the cars that have been staged, and, perforce, the "effect" must be sought for. But the roses—they are everywhere. Looking down the long, broad aisle after entering the building suggests an enticing garden walk. For the first time the ugly posts and girders of Exhibition Hall are almost wholly concealed. Box hedge hides the bases of the posts, and from behind the hedge there climb upward into the girders vines or bushes laden with delicate pink roses; they entwine in the arches formed by the white trellis work pendant from the girders, and these girders, for the occasion,

are made up of false work simulating English beam construction.

In front of each exhibit is a huge potted rose bush bearing roses illuminated from within, and festooned over each aisle is a succession of strings of electric bulbs—all green, green and white, all red and red and white. It all is very beautiful; word description does it but partial justice. There is no evidence of the stinting or economizing such as has been apparent at previous Boston shows. Even the unsightly light well which breaks the upper floor and permits a glimpse of the beauty below has been unusually well treated. The roses climb even that high. The second floor, which is given over to accessories, does not readily lend itself to decorative treatment, but bunting and flags well disposed serve to remove its "rough edges."

Passing into Grand Hall is almost equivalent to passing into another atmosphere, as befits stepping directly from a rose-grown English estate to an austere and palm-leaved region of Spanish missions.



ANOTHER VIEW OF GRAND HALL TAKEN FROM THE OPPOSITE END OF THE BUILDING

The change from roses to palms is more immediately apparent than the change from English to Spanish suggestions. For it requires a few moments to "get the hang" of the mission effect. Most of it—the keynote of it, at any rate—is upreared on the balcony, where the Bostonian loves to sit for hours and listen to the music of the white-gowned orchestra. For the ladies made the music as of yore, and it was sweet music, too, and they were ensconced in a sounding board, also of Spanish mission design.

The chief ornamentation, however, ran the full length of the balcony on either side of the hall—a succession of the red-capped, scalloped arches distinctive of Spanish mission architecture, each of which is pierced centrally by a circular opening in which is suspended a bell of the familiar mission pattern. But the arches are nearly dead white, and the bell is red and illuminated from within. Between each scalloped arch vines clamber up a fine white trellis, and waving high above is a thin palm. The

railing of the balcony is hidden by a red and white painted trellised design, set off with a festoon of flowers, each looping being "pinned" by a bunch of softly tinted illuminated flowers. On the main floor the exhibits are separated by a low white wall, atop of which a small trellis is reared and on which vines creep. On each corner of the several aisles tall, white, red-capped posts are erected, from the tops of which sprout healthy palms. The exhibitors' signs also are of white, red-trimmed. There are long strings of vari-colored electric bulbs, and from the blue sky above—painted, of course—there are many hanging baskets of illuminated flowers. The whole design is original and pleasing to the eye, but with imagination whetted for mission structures of sunburned tints and bronzed bells, somehow that beautiful rose garden in the larger hall next door has a fascination all its own. Its beauty leaves no room for dispute.

Since it acquired the habit, Boston always has loved its annual automobile show;

and it has lost none of its affection. Which is another way of saying that bumper houses are the rule each night and most of the afternoon. Of course, agents long since "signed up," and Boston, as usual, is an owners' and would-be and never-will-be owners' show, but if great crowds mean anything, then the Boston Automobile Dealers' Association has given the selling season of gentle springtime a fillip, with a capital "fill."

As handsome as are the decorations, they serve to detract little from the attractiveness of the cars which are exhibited under them and among them. Gleaming paintwork and shining brass are everywhere punctuated by what someone with a sense of humor has seen fit to style "naked" chassis, either enameled in white or blue, or just merely polished and polished again until every bolt and nut and shaft and rod stands out and emphasizes the nicety with which they fit and the work of artisans in creating out of seeming chaos "the car beautiful."

As was the case at the Chicago show, and has been the case at previous Boston shows, a great many of the exhibits have been transplanted bodily from the preceding national exhibitions, but in the interim between the shows several manufacturers have brought to light something new, something that has been reserved, so to speak, for the Hub show. Few of the manufacturers who were represented at the New York or Chicago shows are missing, and in nearly every case the exhibits occupy very much larger spaces.

For instance, on entering Exhibition Hall, almost the first thing to greet the eye is the Fiat exhibit; it is a Fiat exhibit far bigger and better than was made at either of the previous shows, however, and contains no less than five complete cars and a chassis. Naturally, the six-cylinder cars attract most—the chassis is of the six-cylinder variety—though there is a clever little

starter puffs, but in a muffled sort of a way, even as it did in New York and Chicago. The lecturer lectures and presses the button and of course the engine starts—as it always does—though there are those who stand around in open-mouthed wonder and speculate when it is going to fail to work. As for the cars in the exhibit, there are no less than nine of them, including roadsters, touring cars and a luxurious double limousine built on the "36" chassis.

At the Stoddard-Dayton space there is another big double limousine, but it resembles the fancifully-colored car which was exhibited in New York and Chicago only in that it is mounted on a six-cylinder Knight-engined chassis as was the other. The body itself, though none the less pleasing and comfort suggesting, is done in more somber colors, as befits the dignity of a product equipped with the only engine of its kind built in the United States.

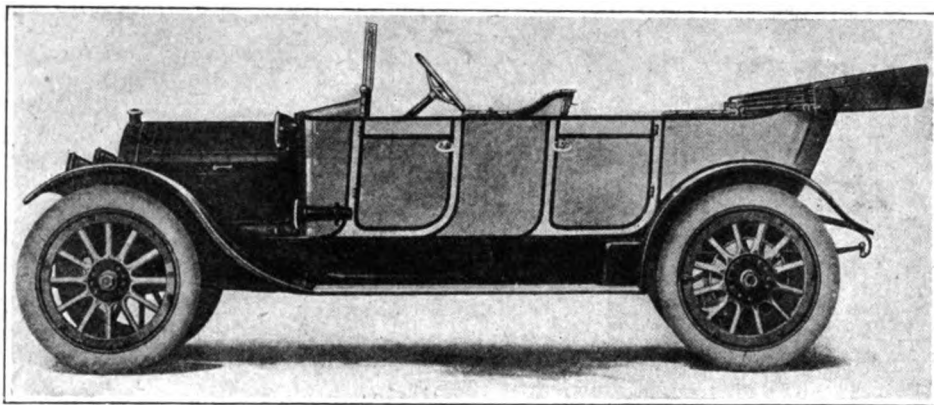
limousine which pleased the eye at the Garden and Coliseum shows. Otherwise, it is entirely different, however, and is styled a "Sociable" limousine by reason of the ingenious seating arrangement. Nominally five passengers are carried, not counting the driver, who is allotted a tiny compartment all by himself. The rear seat in the passenger compartment is roomy enough for three persons, and two more are accommodated on a folding and swiveling chair in the space beside the driver's "box"—one passenger faces forward and the other faces backward. Altogether it is quite a clever arrangement. The front glass is divided vertically and also horizontally, so that the driver may open his half without causing a draft on the occupants of the rest of the body. Similarly, the other half of the glass front may be opened without interfering with the driver.

The Maxwell cars are all there as a matter of course, the whole family of them, from the two-cylinder Messenger, which is a roadster, to the latest model, the Special, which is a touring car seating five passengers. It was a team of three Specials with which the Glidden trophy was won, be it remembered, and of course everybody wants to see them if for no other reason, though in strict justice to the cars there are plenty of other reasons for the desire. A Special chassis is there for spectators to examine and to wonder over—to wonder how the manufacturers find it possible to put so much real value in a car at such a low figure.

The Thomas "wooden" roadster, which was not wood at all, though it was cleverly painted and grained in a wonderful representation of wood, is not at the show, but its place is taken by a full-fledged touring car that is even more attractive than the smaller car which helped to fill out the Thomas exhibit at the previous shows. Also there is a chassis and two other touring cars, all of them of the six-cylinder variety and fairly quozing the quality which has become a byword for the name Thomas.

The Packard exhibit is another which has been made very much more complete, and under the watchful eye of Alvin T. Fuller, the company's Boston representative, the stage space has blossomed out into a veritable show of itself. There are four of the new six-cylinder cars—a double limousine, a touring car, a roadster and a phaeton, the latter being probably the richest car in the show, all finished in dark maroon with gold-plated metal trimmings—and a six-cylinder chassis, to say nothing of two of the older but none the less attractive four-cylinder 30-horsepower models in touring car form. Occupying the other half of the elevated stage, the Cadillac exhibit also is exceptionally complete, a big double limousine vying for attention with three or four touring cars and a stripped chassis.

About the Pierce-Arrow space there lurks an almost indefinable air of quiet and



FIVE-PASSENGER ATLAS-KNIGHT TOURING CAR

convertible roadster with a four-cylinder engine and a removable rear compartment which can be replaced by a pair of seats that is almost equally attractive. The front compartment is closed and with the "lid" on the back in place of the extra seats, there is nothing to suggest that the car is other than the orthodox two-passenger roadster, and an exceptionally "nifty" looking one at that.

A little further down the aisle is the Premier exhibit, also larger and more complete, one of its prominent features being a convertible landaulet-touring car of the type which but recently has been added to the Premier line as a direct result of the experience of the company in catering to the needs of the cross-country tourist. It is finished in a pretty combination of pale green and white, and the control levers are located in the center of the footboard.

"Next door" is located the Locomobile exhibit, complete with both four- and six-cylinder cars, though the new "6-38" "hogs the limelight" by reason of its newness and the cleverness which is apparent in the disposition and finish of the component parts. And if one listens and follows the auto-suggestion conveyed by the hearing, one quite naturally gravitates over to the Chalmers space, where the Chalmers engine

The Knight exhibit—the sectioned cylinder under a glass case and operable by means of a hand crank—is there too, in front of an inside-driven coupe of gorgeous coloring that almost but not quite eclipses Knight's now famous mechanism. The body is finished in bright yellow set off by a slate gray hood and fenders and running gear; it is mounted on one of the poppet-valve-engined chassis.

Knight engine exponents are well represented otherwise, too, by both Stearns and Columbia cars, which are exhibited in the same space in great variety, the Stearns section being graced by three cars, one a landaulet and the others touring cars, and the Columbia section including three cars also—a limousine and two closed front touring cars.

From the main floor and leading to the basement there is a broad stairway, and over it the exhibitors of Marmon cars have elected to make display of some of the trophies that have been won with the well-known "32's"—it is the most effective spot in the big hall for the display, though safe to say the trophies would attract attention anywhere else by reason of their number and sizes. Ray Harroun's "Wasp" is there, too, and there is another new limousine painted almost exactly like the "Torpedo"

refinement; there is little of the hurry and bustle that there is at nearly all the other spaces. Flanking the exhibit on either side there are two limousines which with their gracefully arched roofs and well-proportioned lines stand out well defined among the other cars. The rest of the exhibit includes practically all the models which come from the Pierce-Arrow factory.

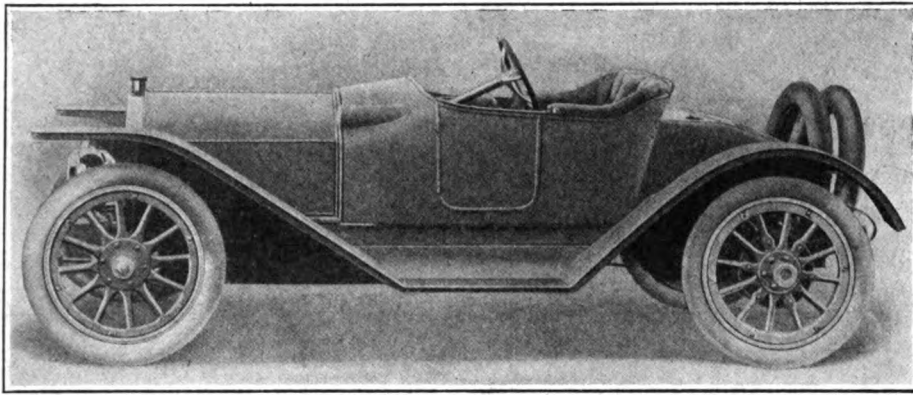
As has already been stated, very few of the manufacturers who were represented at the previous shows are missing; everywhere familiar names greet the eye: Peerless and Garford, Franklin and Matheson,

tice of other designers in its entirety, and consequently there are numerous deviations from the beaten path, not only as concerns the engine, but other component parts of the car as well.

The principle of the engine, of course, is the Knight principle—two sliding concentric sleeves which take the place of the usual poppet valves—and in construction it varies very little from other Knight engines in the application of the principle except that the movement of the sleeves is slightly less. There are four cylinders cast in pairs, and they measure $4\frac{1}{2}$ inches stroke

manner made common in other Knight engines. Ignition is effected by means of an Eisemann high tension magneto, with automatic advance and retard, regulated according to the speed of the engine. For carburation a multiple jet Stromberg carburetter is relied on.

In the transmission elements of the car there is as much out of the ordinary as there is in the engine, probably the most notable feature being the method of final drive, which is by means of an underhung worm. Though this in itself is a brand new feature, so far as American pleasure cars are concerned, the manufacturers of the Atlas have gone even further and have incorporated the change gear mechanism in the same housing with the differential and worm drive mechanism; three speeds forward and reverse, selectively obtained, are provided, the gear shifting lever, together with the emergency brake lever, being located in the center of the footboard, with the steering wheel at the left side, in conformity with the growing tendency toward this form of construction. Power is transmitted through the agency of a three-plate clutch, the plates of which are faced with Raybestos. The drive axles are the full-floating flange type and are of chrome-vanadium, heat-treated steel. All the change speed gears and the ring worm wheel can be removed without the necessity of disturbing other elements. To absorb torsional strains, a heavy combination torsion and drag tube is used and encircles the propeller shaft. The chassis is mounted



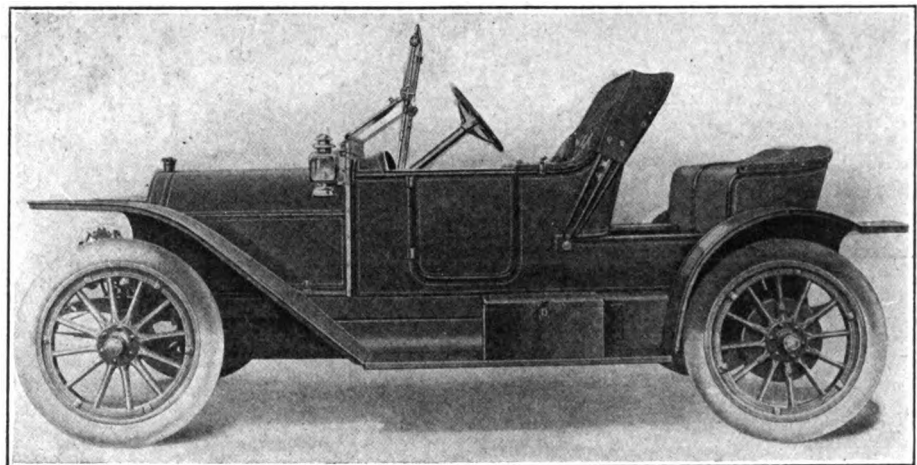
LENOX "SPEED ROADSTER"—A BRAND NEW MODEL

Alco and Lozier, White and National, Everitt, Reo, Winton, Rambler, American, Overland, Inter-State, Speedwell, Kissel and a host of others, all of them well-known to the motoring public and a good percentage of the public that does not motor. To those who have seen the other national shows it is an old, old story, rewritten in parts, better illustrated and rebound, but still the same old story. But no less than 11 new chapters have been added, in a manner of speaking, and to quote the words of the book reviewer, there is a thrill in every one of them. Some of them represent cars that have not been seen at a national show for years—vide, the Ford and the Apperson—some of them seldom are exhibited anywhere except in Boston, and still others never have been exhibited at any national show before, the reason being that they are brand new out of the shops with the paint hardly dried on them. As a matter of fact there is one of them that is minus its engine, in such a hurry were the manufacturers to get the car to the show. Rather than leave the space unoccupied, the car was rushed through, and there are few who are likely to notice the discrepancy, for the hood is down—and locked.

The car is the long-heralded Atlas-Knight, the product of the Atlas Motor Car Co., of Springfield, Mass., which is the latest company to exploit the Knight engine and which is well known by reason of the Atlas two-cycle cars which have come from the same factories. In adopting the Knight engine, however, the company

has not been content to accept the prac-

and $5\frac{1}{2}$ inches bore; the horse-power rating at 1,200 revolutions a minute is 50. The crankshaft is exceptionally large and is carried in five bearings, bronze bushed and babbitt lined. A pair of cylinders, with



LENOX ROADSTER WITH TWIN RUMBLE SEATS

their sleeves and other parts, are on view and exhibit a remarkable degree of care in finish, the connecting rods in particular being of interest for the reason that they are tubular in form, a method of construction which heretofore has been confined principally to racing engines and those of the very finest construction; each connecting rod weighs but four pounds, complete, with its babbitt bearings.

Cooling is by water circulated with the aid of a centrifugal pump, the fan, magneto, pump and eccentric shaft all being driven by means of "silent" chain, after the

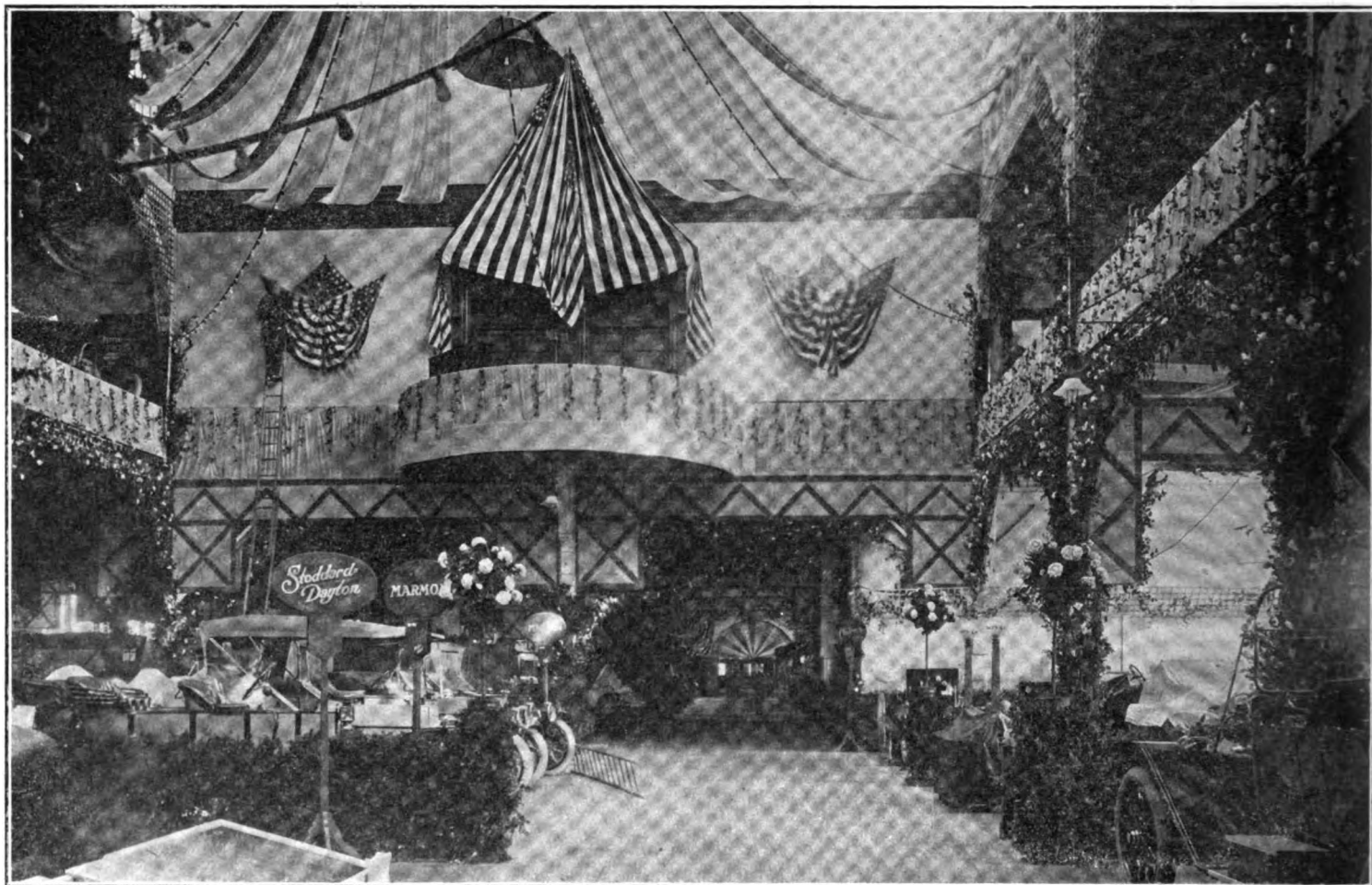
on exceptionally wide springs, the front members being semi-elliptic and the rear members three-quarter elliptic. Both front and rear wheels are shod with 37x5-inch tires, mounted on demountable, quick-detachable rims. The wheel base of the five-passenger car is 130 inches and of the seven-passenger car it is 140 inches.

The list price of the car, which is \$3,500 with a five-passenger body and \$3,700 with a seven-passenger body, includes as standard equipment such usual items as a top, windshield and speedometer, and in addition there is a combination electric engine

starting and car lighting system and a Tuto electric horn. The electric lighting system includes head, side and tail lamps, and also dash and tonneau lights. Bodies are exceptionally roomy, the rear seat being 54 inches in width, and there is a corresponding amount of legroom between the front and rear seats. In general, a straight-line effect has been preserved, though the severity is lessened somewhat by well-shaped doors and lines that blend well together. All bodies are equipped with front doors, as a matter of course, and there is

and which never fails to attract a throng of admirers, to a berline limousine of the heavy, expensive-looking type. It is to the "speed" roadster, however, to which the present interest attaches. It is of the compartment type, with high sides and a very deep skuttle, into which the side lights are set in elongated tunnels, which materially enhance the "chic" appearance of the body. Lenox motors are of the L-head type, with the valves enclosed and the cylinders cast in pairs; the bore and stroke are $4\frac{1}{8}$ inches and $5\frac{1}{4}$ inches, respectively, and the rated

hibited is the engine and the method of forming the water jackets of copper. The reason for the method, it is explained, is to obtain the maximum cooling effect with the minimum of weight. Incidentally, the method of casting the cylinders in pairs and surrounding each pair with a single jacket permits the valve stems and guides, as well as the valve pockets, to be water cooled. The Chadwick company is another in the comparatively small clan of manufacturers who devote their entire energies to the production of six-cylinder cars, and



EYE-PLEASING TREATMENT OF THE UGLY LIGHT WELL IN EXHIBITION HALL

a very deep skuttle which serves to enclose the gasoline tank, which can be filled by means of a filler cap located well to one side.

Of the other cars which are displayed for the first time this year, the Lenox, which is manufactured and exhibited by the Lenox Motor Car Co., has the distinction of having been reserved for exhibition in its own home town; there are any number of big signs hung about the space to apprise the public that the car is "Built in Boston," and from the appearance of the chassis and the finished cars on view the manufacturers have real reason to be proud of their product. But one chassis is manufactured, but on it are mounted a variety of body styles ranging from a classy "speed" roadster, which just has been added to the line

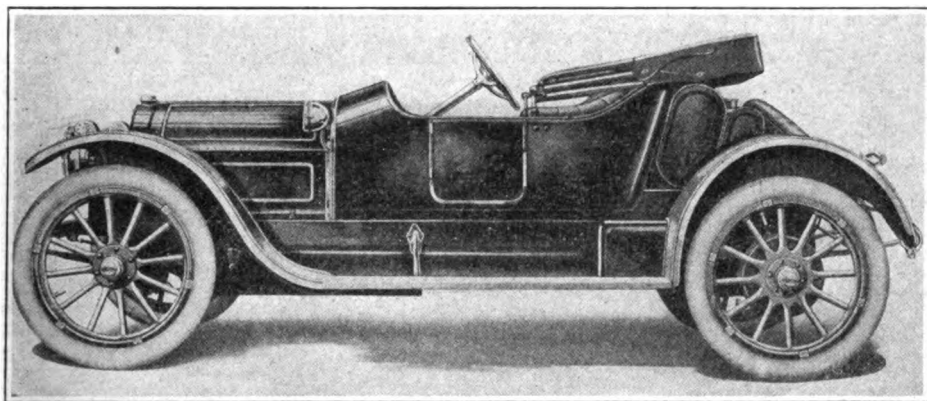
horsepower is 30-35. Standard practice has been strictly adhered to in the arrangement of the transmission elements, some of the excellent points being its cone clutch with spring inserts, its three-speed selectively operated change speed mechanism located on the rear axle and full-floating rear axles with twin expanding brakes, for service and emergency.

The Chadwick, which also is among the cars which were not at either of the national shows, is one of the few which really reeks of individuality; there scarcely is a part in it that is like parts which are used in other cars; it almost literally is in a class by itself. "The Great Chadwick," it is styled by its manufacturers, and it is great in more ways than one. Perhaps the most distinctive point of the chassis which is ex-

the products are rendered still more distinctive by reason of the fact that they are among the still smaller class of pleasure cars that are equipped exclusively with side chains for final drive, which method of drive, the manufacturers claim, can be made the most efficient and silent; silence is obtained in the case of the Chadwick by the simple expedient of enclosing the chains in dust and dirt proof chain cases, which thus serve a double purpose. The clutch is of the internal expanding type, of the same general design that always has been used in Chadwick cars. The change speed mechanism is of the semi-selective type, permitting four forward and one reverse speeds, and is located in the waist of the chassis. The design of the mechanism is distinctive of the Chadwick cars, and em-

braces a double-faced bevel final drive wheel connected to the jack shaft. The intermediate speeds are from the counter shaft to one side of the bevel wheel, and the high speed is through the other side of the bevel wheel. The service brake is exceptionally large and is located on the jack shaft, the emergency brakes being in the orthodox position on the rear wheels. One of the smaller interesting points in the construction of the chassis lies in the use

in only one other car of American make. Other parts as well are such as have been used for years, and, except for slight refinements calculated to render their action more sweet and uniform, remain practically unchanged. Bodies are pleasing and roomy and incorporating, as they do, such of the ideas of other designers as the manufacturers are convinced are correct, together with not a few ideas which are exclusive to the Apperson cars, give an effect and an



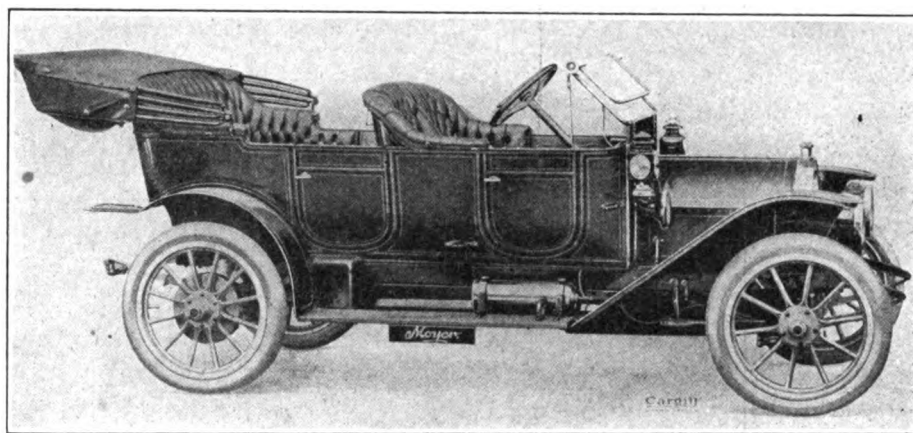
APPERSON 45 HORSEPOWER "JACK RABBIT" ROADSTER

of a "safety link"—as it is styled by the manufacturers—in the front springs, the object of which is to insure the maintenance of the relationship of the axle in case of the fracture of a spring. Another point which evidences the careful manner in which details have been worked out is the employment of an additional number of leaves in the right-hand front spring to allow for the torque of the engine.

Apperson cars have changed but little since last they were displayed at the national show of 1911, a fact which speaks well for the original designs of the Apperson brothers and the distinctive features incorporated in the cars when they were introduced many years ago and which still are retained. The distinctive type of T-head cylinders still is used, though through careful refinement and skilled workmanship the efficiency and silence of the motor have been still further increased, if that is possible. Not the least of the excellent features of the car is that every part is interchangeable with other parts, the scheme having been carried even to the bearings, which are interchangeable for the products of any one of a number of manufacturers. Accessibility is another feature which has been borne in mind by the designers, and the change speed mechanism forms an excellent example of the manner in which this thought has been carried out; the whole mechanism can be lifted out bodily without the necessity of disturbing any other parts or their adjustments other than to disconnect the shafts. The clutch, or course, is the same distinctive Apperson device that has been used ever since Apperson cars have rolled over the roads. It is of the contracting band type, and is used

amount of comfort that is excelled by few.

Reflecting in several respects the experience of its manufacturers, gained during a long term of years as producers of high-grade carriages and buggies, the Moyer car, which is the handiwork of H. A.



FOUR-CYLINDER MOYER EQUIPPED FOR THE ROAD

Moyer, of Syracuse, N. Y., makes its initial appearance at a show outside of its home town, though for several years it has been exhibited annually in Syracuse. It is in the spring suspension of the car that the ingenuity of the designer is most apparent. It is the same method of construction which has been used for years in the construction of Moyer carriages, and is an exclusive feature of the automobiles which bear the same name. The construction is such that both rear springs are caused to support the weight of the car and its load equally, the effect being obtained by the aid of an equalizer, as it is styled, which is merely a cross bar which connects the

springs together at their ends. Though the method as a rule is quite simple, it also is quite effective, the weight of two persons on one side of the chassis which is on view causing both rear springs to be compressed an equal amount. The supplementary effect of the construction is to eliminate sidesway and therefore to reduce the tendency to jump on the road and to skid. Otherwise there is little that is unusual about the car, which follows closely the general lines of accepted practice in the employment of a T-head motor, three-speed selectively operated change gear mechanism and cone clutch. Two chassis sizes are made, a four-cylinder model and a six, practically the only difference being in the arrangement of the cylinders, which in the smaller model are cast in pairs and in the larger one in threes.

To the motorist of even average discernment the Ford car needs no introduction, for the simple reason that there are so many of them running over the roads of the United States and over the roads of Canada; even abroad it scarcely is possible to turn around without seeing or at least hearing of the Ford car, so far-reaching is its reputation. Despite this fact, Ford cars were not displayed at either the New York or Chicago shows, and their appearance in Boston therefore "tallies one more" for the New England exhibition. The Ford chassis itself has been changed so little during the past few years, however, and it is so

well and widely known as scarcely to require mention or exploitation. As heretofore, the distinctive unit power plant, with the planetary change gear mechanism and the magneto enclosed in the flywheel housing, is retained, no room for improvement in either design or construction having been found. Another of the distinctive features of the car is the spring suspension, both front and rear axles being single transverse members, mounted at their extremities on the axles and carrying the body at their centers. This is only one of the evidences of the great simplicity of the car, of which it may be said with more truth than generally is the case: "A child can run it."

In one respect, at least, the Boston show is ahead of its prototypes of New York and Chicago. It houses an example of one of the earliest forms of prime movers—the steam engine—applied to an automobile, a boast which neither of the previous shows could make. The car is the Stanley, and it appears this year, as it did last year and for several years before, with so little alteration as to be scarcely worthy of note. The chassis has been changed slightly—or, rather, there really is a chassis now—there

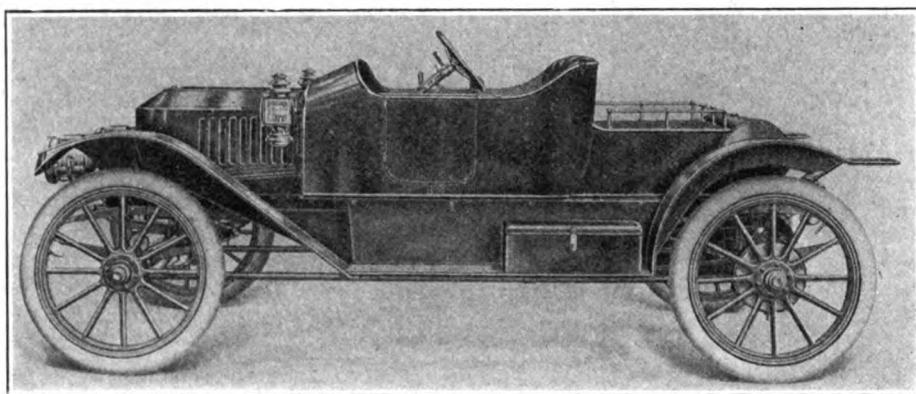
selectively operated, change gear mechanism, while the larger model, rated at 52 horsepower, employs a four-speed change gear. Bodies are the usual straight-line flush-sided creations, and, in conformity with the general practice, equipment includes an engine starter of the acetylene type, in addition to such items as top, windshield and other incidentals.

Though the underslung principle of construction is not new and there are several well-known brands of car of this descrip-

tively; the horsepower rating is 63.5. In order to obtain the maximum power from the engine a special magneto, operating a double set of spark plugs, is used, both sets firing simultaneously. The clutch is of the multiple disk type, composed of 28 saw steel disks and power is transmitted to the full-floating rear axles through the intermediary of a three-speed selectively operated change gear mechanism. Both sets of brakes are on the rear wheels and both are of the internal expanding type. As is usual with underslung vehicles, semi-elliptic springs are used both front and rear. The wheels are shod with 40x4½-inch tires all around, and the wheel base is 136 inches.

Among the unlisted cars in Mechanics' Hall—among the "post entries," so to speak—is the Nyberg, which is the product of the Nyberg Auto Co., of Anderson, Ind. There is little about the car that is startling, the construction being standard in every respect. Two chassis sizes are manufactured, a four-cylinder model rated at 40 horsepower and a six-cylinder model rated at 60 horsepower, and in both of them power is supplied by a Rutenber motor of the latest long-stroke type; the bore and stroke are 4½ and 5¼ inches, respectively, in both motors. The other essential features which are common to both models are a multiple disk clutch, three-speed selectively operated change gear mechanism and full-floating rear axles.

Of the electric cars which are on view, the Rauch & Lang, the Waverley, the Bak-

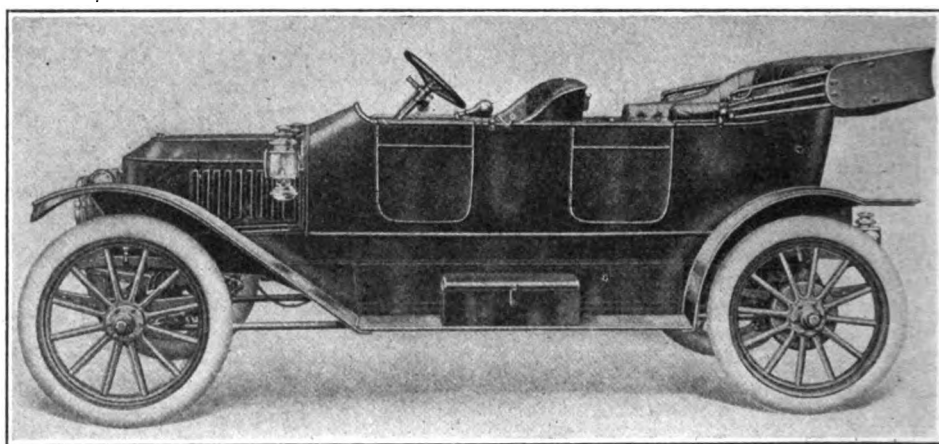


STANLEY STEAM ROADSTER WITH DISTINCTIVE BODY

never was one before, the body being mounted directly on the springs. This year, however, there is a proper chassis frame on which the bodies are built, which permits of easier removal of bodies when necessary, and also makes for greater rigidity. As for the engine and boiler, even less change has been made in their construction and none at all in their design. As heretofore, the engine is of the simple type, and consists of two high-pressure cylinders. The engine is located directly on the rear axle and drives direct through a pair of spur gears, one of which is mounted concentrically with the differential mechanism. The boiler is of the locomotive fire tube type, and the distinctive piano wire winding adopted several years ago, still is retained. The cars are furnished in three different powers—namely, 10, 20 and 30—and except for a difference in the size of the engine cylinders and other component parts to correspond, are almost exactly alike.

The Berkshire is another car which is built practically in Boston, the location of the factories of the manufacturer, the Berkshire Motors Co., being just across the Charles River, in Cambridge, Mass. Though the car is not quite so well known outside of the New England States as are some others, it nevertheless has an established reputation for itself. It is made in two models, both of which employ motors of the same type and cylinder dimensions, the smaller car having four cylinders and the larger one six cylinders; the cylinder dimensions are 4 11/16 x 5 1/2. Both chassis are practically alike, except that the 32 horsepower motor, which is the smaller of the two, is equipped with a three-speed.

tion at the show, the manufacturers of Norwalk cars have carried the idea a little further than is usual by combining with an underslung car a six-cylinder motor—a combination which is quite new and which is an exclusive feature of the line. The car is a new one under a not wholly

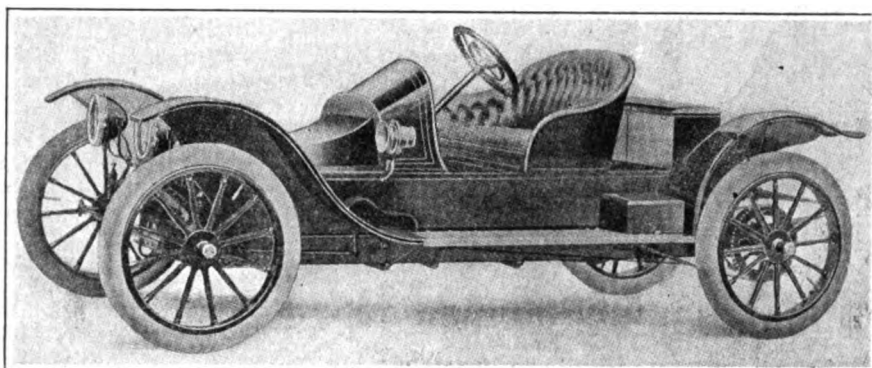


STANLEY STEAMER IN FIVE-PASSENGER TOURING FORM

new name which was recently transplanted from Ohio to West Virginia, and it has very little in common with the Norwalk "Four-Forty-Five" model which was manufactured by the old Norwalk company, one of which is on view beside the newer creation. Thus, for instance, though the motor in the older model has its intake valves in the cylinder heads with the exhaust valves in pockets at the sides, the new six-cylinder motor has all its valves in removable cages in the cylinder heads. The cylinders are cast in pairs, the bore and stroke being four inches and five inches, respec-

er, the Columbus, the Flanders and the Bailey, the last named is the only one which has not previously been exhibited this year, the others having made their annual public appearances either in New York or Chicago. The Bailey line, however, has been increased by the addition of a new model of the roadster type, which is conspicuous for its originality of design and for its speed, which it is asserted can be made to average 20 miles and hour for a run of from 80 to 100 miles on a single charge. This is accountable for by reason of the fact that the Edison bat-

tery is used exclusively and this, in conjunction with a light weight chassis and a motor of exceptionally high efficiency, permits such results. The arrangement of the battery in the new roadster is unique; half of it is located at the rear and is made accessible by lifting the lid of the rear compartment on which the seats and top are mounted. The lid is hinged at its forward end and the seats are thus tipped upward. The other half of the battery is in a corresponding compartment in front of the driver's seat under a low hood. Not a little of the remarkable efficiency of the vehicle is laid to the novel method of spring suspension which is used. Owing to the construction, the clearance from the road is equal to that of the average car, and yet the center of gravity of the car is considerably lower. The front end of the car



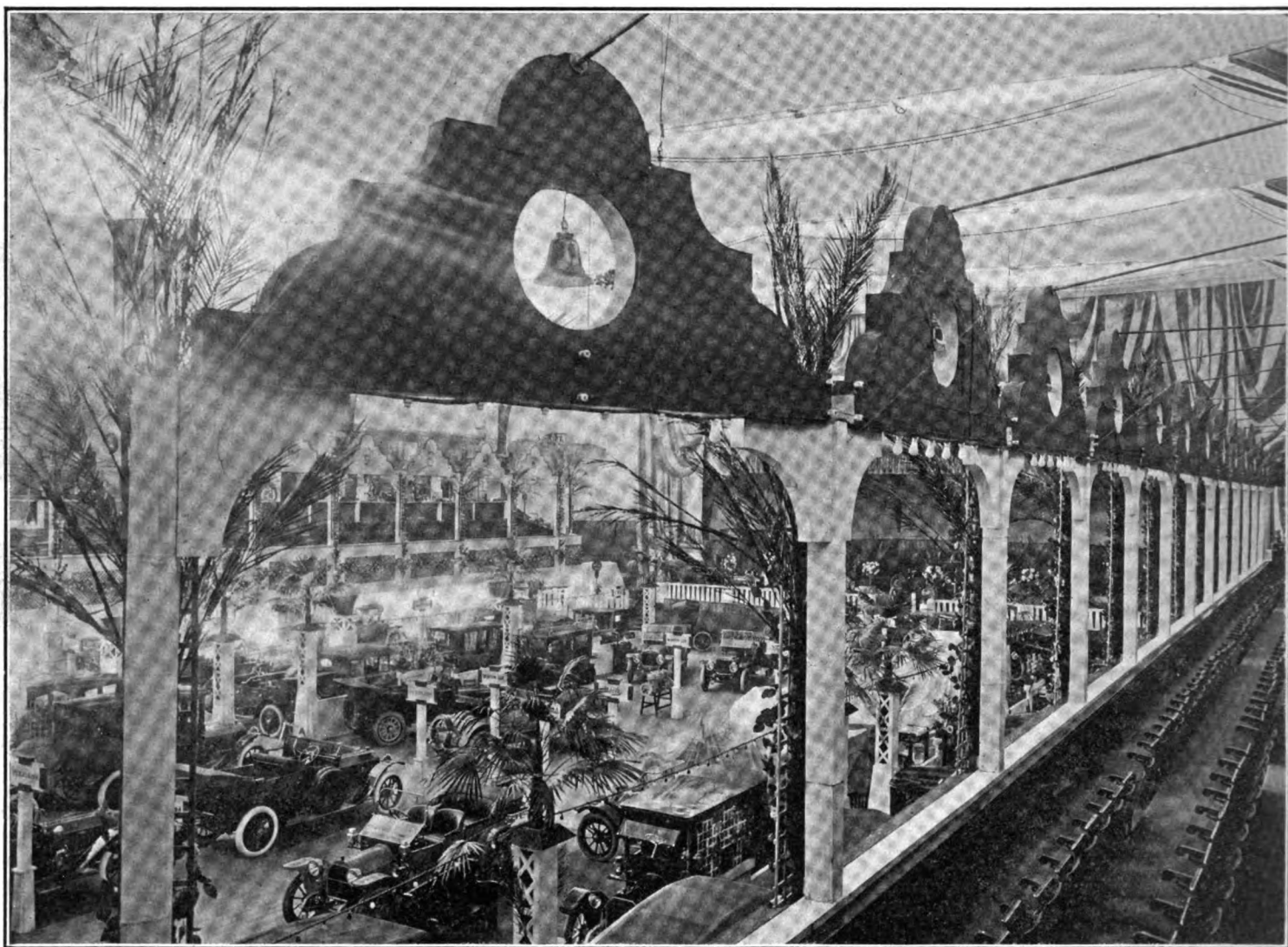
NEW BAILEY HIGH SPEED ELECTRIC ROADSTER

is hung above and in the middle of a long transverse cross spring, extending almost the entire length of the axle, and the point of support of the body is well above the point of the center of gravity. The body is attached to the spring by means of a ball and socket joint, and the axle is free to move at its ends when one wheel drops into a hole or mounts an obstruction in the road. The drive from the motor is by "silent" chain to a countershaft, and thence by side chains to the rear wheels, a method of construction which has been used in the other cars in the line for several years. As heretofore, a steering wheel is used instead of a lever, and the control lever is conveniently placed at the top. One of the noteworthy features which is common to all the cars in the Bailey line is the use of a dash-located kick switch, by means of which half the battery may be disconnected when it is desired to conserve energy or to operate the car at very low speeds, as when driving in crowded traffic.

The full list of automobile exhibitors and the cars they show is as follows:

Summary of Car Exhibitors.

- Atlas Motor Car Co., Springfield, Mass.—One four-cylinder Atlas-Knight touring car.
- American Locomotive Co., Providence, R. I.—One six-cylinder Alco touring car and one six-cylinder chassis.
- Andrews-Dykeman Co., Boston, Mass.—Three Moon cars; two four-cylinder touring cars and one four-cylinder roadster, and one four-cylinder chassis.
- Babcock Electric Carriage Co., Brookline, Mass.—Two Babcock electric roadsters and one coupe.
- Bailey Co., S. R., Amesbury, Mass.—Two Bailey open electric roadsters.
- Berkshire Motors Co., Cambridge, Mass.—Two Berkshire cars: One four-cylinder touring car and one four-cylinder roadster.
- Boston Electric Garage Co., Boston, Mass.—Two Detroit Electric cars: One coupe and one roadster.
- Boston Motor Co., Boston, Mass.—One four-cylinder De Dion brougham and one four-cylinder and one eight-cylinder chassis. Two four-cylinder Pullman
- cylinder Cartercars, friction driven: Two touring cars, one roadster and one coupe and one four-cylinder chassis.
- Center Street Garage, Boston, Mass.—Two four-cylinder Staver-Chicago cars: One touring car and one roadster.
- Columbus Buggy Co., Columbus, Ohio—Three four-cylinder Firestone-Columbus cars: Two touring cars and one roadster; and one Columbus electric coupe.
- Dodge Motor Vehicle Co., Cambridge, Mass.—Three Pope-Hartford cars: One six-cylinder runabout, one six-cylinder coupe and one four-cylinder phaeton.
- E-M-F Boston Co., Boston, Mass.—One four-cylinder E-M-F touring car and two four-cylinder Flanders cars; one touring car and one roadster, and one four-cylinder split chassis.
- Empire Motor Car Agency, Boston, Mass.—Two four-cylinder Stutz cars; one touring car and one roadster, and one four-cylinder chassis.
- Essex Automobile Co., Boston, Mass.—Two four-cylinder American underslung touring cars.
- Flanders Mfg. Co., Pontiac, Mich.—One Flanders electric coupe.
- Fuller, Alvin T., Boston, Mass.—Six Packard cars: Two four-cylinder touring cars, one six-cylinder touring car, one six-cylinder phaeton, one six-cylinder double limousine and one six-cylinder roadster, and one six-cylinder chassis.
- Fiat Automobile Co., Boston, Mass.—Five Fiat cars: One six-cylinder touring car, one four-cylinder roadster, one four-cylinder limousine and two four-cylinder touring cars, and one six-cylinder chassis.
- Ford Motor Co., Boston, Mass.—Four four-cylinder Ford cars: One touring car, one landaulet and two roadsters.
- Franklin Automobile Co., Boston, Mass.—Five Franklin cars: One six-cylinder touring car, one six-cylinder limousine, two four-cylinder touring cars and one four-cylinder roadster.
- Furbush, A. J., Brighton, Mass.—Two Moyer cars: One six-cylinder touring car and one four-cylinder touring car, one one four-cylinder chassis.
- Grant Co., Harry F., Boston, Mass.—One four-cylinder Apperson touring car.
- Habich Co., G. E. & H. J., Boston, Mass.—Three four-cylinder Cole cars: One roadster and two touring cars, and one four-cylinder chassis.
- Harrington & Co., J. S., Boston, Mass.—Four Everitt cars: One six-cylinder touring car, one six-cylinder roadster and two four-cylinder touring cars, and one six-cylinder chassis.
- Havers Motor Car Co., Port Huron, Mich.—Two six-cylinder Havers cars: One touring car and one roadster.
- Hollander Motor Co., Boston, Mass.—Three four-cylinder Metz roadsters and one four-cylinder chassis.
- Henley-Kimball Co., Boston, Mass.—Three four-cylinder Hudson cars: Two
- touring cars. One four-cylinder S. G. V. limousine.
- Bowman Co., J. W., Boston, Mass.—Six Stevens-Duryea cars: Two four-cylinder touring cars, one each four-cylinder roadster, and convertible phaeton, two four-cylinder limousines and one four-cylinder chassis. Two Waverley electric cars: one coupe and one roadster.
- Buick Motor Co., Flint, Mich.—Seven four-cylinder Buick cars: Five touring cars and two roadsters and one four-cylinder chassis.
- Cadillac Automobile Co. of Boston, Boston, Mass.—Four four-cylinder Cadillac cars: One touring car, one roadster, one double limousine and one phaeton and one four-cylinder chassis.
- Connell & McKone Co., Boston, Mass.—Four six-cylinder Overland cars: Three touring cars and one roadster and one four-cylinder chassis.
- Curtis-Hawkins Co., Boston, Mass.—Four four-cylinder Speedwell cars: Two touring cars and two roadsters and one four-cylinder chassis.
- Case Threshing Machine Co., J. I., Racine, Wis.—Two four-cylinder Case cars: one touring car and one roadster.
- Clark-Carter Auto Co., Jackson, Mich.—Three four-cylinder Cutting cars: One roadster and two touring cars and one four-cylinder chassis.
- Cartercar Co., Pontiac, Mich.—Four four-



AN UNUSUAL VIEW IN GRAND HALL, TAKEN FROM "ACCESSORY ROW" ON THE BALCONY

- touring cars and one roadster, and one four-cylinder chassis.
- Imperial Automobile Co., Jackson, Mich.—Two four-cylinder Imperial cars: One touring car and one roadster.
- Inter-State Automobile Co., Boston, Mass.—Three four-cylinder Inter-State cars: Two touring cars and one roadster, and one four-cylinder chassis.
- Jenkins & Co., W. M., Boston, Mass.—Two four-cylinder Abbott-Detroit touring cars and one four-cylinder Krit touring car.
- Jeffery Co., Thomas B., Boston, Mass.—Four four-cylinder Rambler cars: One double limousine and three touring cars, and one four-cylinder chassis.
- Jackson Motor Co., Boston, Mass.—Two four-cylinder Jackson cars: One roadster and one touring car.
- Kimball Bros. Carriage Co., Boston, Mass.—Two four-cylinder Ohio cars: One touring car and one roadster.
- Kissel Kar Co., Northeastern Branch, Boston, Mass.—Two four-cylinder Kissel touring cars.
- Koehler Sporting Goods Co., H. J., Boston, Mass.—Three four-cylinder Hupmobile cars: One touring car, two roadsters.
- Lawrence & Stanley, Boston, Mass.—Four Mitchell cars: One six-cylinder touring car, one six-cylinder roadster, one four-cylinder touring car and one four-cylinder roadster, and one six-cylinder polished chassis.
- Lozier Motor Co., Detroit, Mich.—Three six-cylinder Lozier cars: One touring car, one roadster and one double limousine, and one six-cylinder chassis.
- Locomobile Co. of America, Bridgeport, Conn.—Five Locomobile cars: One four-cylinder car, one six-cylinder limousine and three six-cylinder touring cars, and one six-cylinder chassis.
- Linscott Motor Co., Boston, Mass.—Three four-cylinder Reo cars: Two touring cars and one roadster.
- Lenox Motor Car Co., Boston, Mass.—Two four-cylinder Lenox cars: One touring car and one roadster, and one four-cylinder chassis.
- Lexington Co. of New England, Boston, Mass.—Three Lexington cars: One six-cylinder touring car, one four-cylinder touring car and one four cylinder roadster.
- MacAlman, J. H., Boston, Mass.—Three four-cylinder Pierce-Arrow cars: Three touring cars, two limousines and one roadster, and one six-cylinder chassis.
- Massachusetts Motor Co., Boston, Mass.—Six four-cylinder Oakland cars: Three touring cars, two roadsters and one double limousine.
- Matheson Automobile Co., Wilkes-Barre, Pa.—Two six-cylinder Matheson cars: One touring car and one roadster, and one six-cylinder chassis.
- Marquette Co., Boston, Mass.—Three four-cylinder Marquette cars: Two touring cars and one roadster, and one four cylinder chassis.
- Middleboro Auto Exchange, Middleboro, Mass.—One six-cylinder McFarlan roadster.
- Morse & Co., Alfred Cutler, Boston, Mass.—Three four-cylinder Renault cars: One touring car, one double limousine and one phaeton, and two four-cylinder chassis: one four-cylinder Metallurgique chassis.
- Motor Vehicle Co., Boston, Mass.—Three four-cylinder Warren cars: Two touring cars and one roadster, and one four-cylinder chassis.

- Neals, A. F., Boston, Mass.—One Baker Electric coupe.
- Ohio Electric Car Co., Cleveland, Ohio—One Ohio electric Victoria and one chassis.
- Oldsmobile Co. of Massachusetts, Boston, Mass.—Four Oldsmobile cars: One six-cylinder touring car, two four-cylinder touring cars and one four cylinder roadster.
- Ottomobile Co., Philadelphia, Pa.—Two four-cylinder Otto touring cars and one four-cylinder chassis.
- Peerless Motor Car Co. of New England, Boston, Mass.—Six Peerless cars: Four six-cylinder touring cars, one six-cylinder double limousine and one four-cylinder limousine.
- Penn Motor Car Co. of New England, Boston, Mass.—Four four-cylinder Penn cars: One touring car and three roadsters.
- Premier Motor Car Co., Boston, Mass.—Three Premier cars: One six-cylinder touring car, one four-cylinder touring car, one six-cylinder convertible landaulet, and one six-cylinder chassis.
- Regal Motor Car Co., Detroit, Mich.—Four four-cylinder Regal cars: One roadster, one coupe and two touring cars, and one four-cylinder chassis.
- R. C. H. Corporation, Detroit, Mich.—One four-cylinder R. C. H. touring car and one four-cylinder chassis; two Hupp-Yeats electric coupes.
- Rogers, Milton, Boston, Mass.—One six-cylinder Norwalk underslung touring car.
- Russell & Co., W. L., Boston, Mass.—Three four-cylinder Haynes cars: One roadster and two touring cars, and one four-cylinder chassis; one four-cylinder Regal touring car.
- Smith Auto Co., C. H., Boston, Mass.—Two four-cylinder, two-cycle Elmore touring cars; two four-cylinder Nyberg touring cars and one four-cylinder chassis.
- Smith, Fred S., Boston, Mass.—Three four-cylinder Mercer cars: One touring car and two roadsters, and one four-cylinder chassis.
- Stanley Motor Carriage Co., Newton, Mass.—Three Stanley steam cars: Two touring cars and one roadster.
- Stevens, W. H., Boston, Mass.—Three four-cylinder National touring cars: Two touring cars and one roadster.
- Thomas Motor Car Co., E. R., Buffalo, N. Y.—Three six-cylinder Thomas touring cars and one six-cylinder chassis.
- Thomas & Co., Boston Mass.—Two four-cylinder Cunningham touring cars.
- Tiffany Co., D. C., Boston, Mass.—One Rauch & Lang electric coupe.
- Underhill Co., Boston, Mass.—Six Knox cars: Two six-cylinder touring cars, three four-cylinder touring cars, and one four-cylinder double limousine.
- United Motor Boston Co., Boston, Mass.—Four Stoddard-Dayton cars: One six-cylinder double limousine with Knight motor, two four-cylinder touring cars and one four-cylinder roadster. Five Maxwell cars: Two four-cylinder touring cars, one four-cylinder roadster and two two-cylinder roadsters, and one four-cylinder chassis.
- Velie Motor Vehicle Co., Moline, Ill.—Two four-cylinder Velie cars: One touring car and one roadster.
- Wentworth, F. E., Boston, Mass.—Two four-cylinder Marion touring cars. Two Garford cars: One four-cylinder and one six-cylinder touring car.
- Westcott Motor Co., Richmond, Ind.—Three four-cylinder Westcott cars: Two touring cars and one roadster, and one four-cylinder chassis.
- White Co., Boston, Mass.—Five White cars: One six-cylinder touring car, one each four-cylinder touring car, limousine, landaulet and roadster, and one four-cylinder chassis.
- White, Ware & Leatherbee, Boston, Mass.—Three four-cylinder Bergdoll cars: Two touring cars and one roadster.
- Whitney-Barney Co., Boston, Mass.—One six-cylinder Chadwick touring car and one six-cylinder chassis. Two four-cylinder Lion cars: One touring car and one roadster. Two four-cylinder touring cars.
- Whitten-Gilmore Co., Boston, Mass.—Nine Chalmers cars: Two four-cylinder roadsters, three four-cylinder touring cars, one each four-cylinder double limousine and coupe, and two six-cylinder touring cars and one four-cylinder chassis.
- Wing Motor Car Co., F. E., Boston, Mass.—Four four-cylinder Marmon cars: Two touring cars, one limousine and one roadster, and one four-cylinder chassis; one Marmon racing car.
- Winton Motor Carriage Co., Cleveland, Ohio—Five six-cylinder Winton cars: Three touring cars, one roadster and one double limousine, and one six-cylinder chassis.
- Wise Co., S. J., Boston, Mass.—One four-cylinder Amplex touring car and one four-cylinder chassis; one four-cylinder King roadster, one four-cylinder chassis.

Motorcycles.

- American Motor Co., Brockton, Mass.—M. M.
- Boyd Motor Co., Boston, Mass.—Minneapolis.
- Holden, Geo. N., Boston, Mass.—Indian.

Miss Knight's Engines and the Other Accessories Exhibited in Boston

It may be that New England is the abiding place of Yankee ingenuity or it may be due to the near approach of spring, but somehow or other the Boston show always brings out a surprising number of new accessories or accessories that are seen at no other show, and the present exhibition is no exception to the rule.

Among the other things, this year's display is marked by the first appearance of three new engine starters, and of not one, but two more of those innumerable devices designed "to put the pneumatic tire out of business." The Ellis "steel cushion tire," "a complete, scientific solution of the tire problem," is one of them. It is an amazing and intricate collection of coil springs and compound levers compactly arranged around the periphery of the wheel, and, take the word of the inventor for it, "the patent offices of the United States and foreign countries have revealed nothing similar." The other pneumatic tire emu-

lator is the Comfort spring tire, a California invention, presented, however, by the Davies Mfg. Co., of Detroit. Unlike the Ellis device, however, it does not entirely do away with rubber, a combination of coil springs to take the drive, and semi-elliptic springs to sustain the weight of the vehicle being arranged between a solid rubber tread and the steel felloe band.

But of the very many things included under the head of accessories, and of those that never had been seen before, none are more interesting or ingenious or so full of suggestion as the motor—or, rather, motors—invented by a woman, Miss Margaret E. Knight, of South Framingham, Mass.

Miss Knight's engine is displayed in the basement, and to those of the 101 showgoers to whom an engine is an engine and nothing more it perhaps is less interesting than the ivory souvenirs near-by. But to those who know the suggestiveness of the name Knight when applied to a motor and

to whom an engine is more than a mere mass of metal the sign "1896," which is displayed on one of the two engines in the Knight booth, and the sign "1912" on the other, is sufficient to arrest instant attention.

The K-D engine, as it is styled, is a sleeve valve engine, and differs from others of that type chiefly in two essential features: The valves are "crescent" or semi-circular in shape and are arranged concentrically with the piston, and they are located between the cylinder wall and the water jacket instead of between the piston and the cylinder walls, as is the case with every other sleeve valve engine which has been brought to commercial perfection. The arrangement of the other component parts of the engine also is extraordinary, as may be judged from the accompanying cross sectional drawing of one of the cylinders. For the edification and education of showgoers the action of the four-cylinder

engine which is on view is rendered plain with the help of an electric motor harnessed to it by means of a belt, and to those who are sufficiently interested the demonstrator discourses in quiet tones on the construction, the theory and the operation of the engine.

Referring to the illustration, A and B are the two "crescent" valves which serve for exhaust and intake. A' and B' represent their sections, and the valves together completely encircle the cylinder and overlap as a scarf joint, indicated as C. In these sleeves there are ports (O and O') which register, one with a port in the cylinder wall serving for the intake and the other with a similarly placed port on the opposite side of the cylinder wall and serving for the exhaust. E is the exhaust opening and the sleeve port is shown in register with the cylinder wall port, the piston (P) being on the up stroke and the cylinder exhausting. The sleeves are actuated through long clindrical rods (F and G), which in turn are operated by means of cranks on a longitudinal shaft which takes the place of the usual cam shaft and is driven through gearing from the crank shaft at half crank shaft speed. The cylinder wall is in the form of a liner, shown in section by D and D', and one of the peculiar features of the engine is that this cylinder liner wall is held in place only by being clamped between the top of the removable cylinder head (N), which really is the whole cylinder, and the crank case, shown in section as H and H'. W is the water jacket, which extends the full length of the cylinder and well up into the head.

In designing the piston and connecting rod mechanism, a leaf has been borrowed from the steam engineer's book, and the usual arrangement altered slightly to include a piston rod. Though the reason almost is obvious, to eliminate side thrust and permit the piston only a straight up and down motion—part of it at least is obscure and scarcely would be suspected. For each cylinder there is an outside exhaust pipe which leads the exhaust downward and into the engine base at the port K, whence it enters the piston into the space L, and thence out on the other side by way of the port M. The reason for the unusual though not altogether unheard of construction, it is explained, is, to assist in muffling the noise of the exhaust and also to obtain a slight increase of power due to the expansive power of the exhaust gases below the piston.

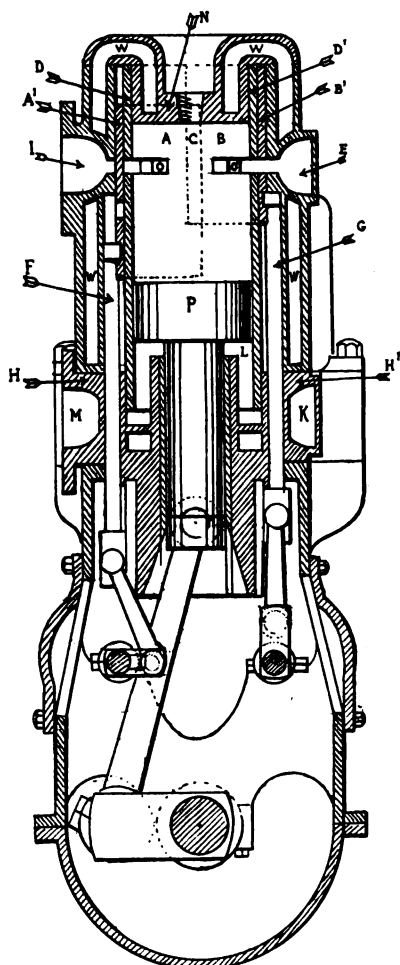
The bore and stroke of the engine displayed are four inches and six inches, respectively, and, though the rated horsepower according to A. L. A. M. formula is but 25.60, it is claimed that in excess of 50 horsepower has been developed on an actual brake test. Inasmuch as other sleeve engines have shown increased power over poppet valve engines of the same cylinder dimensions, the result is not extraordinary, though how much of the added power is

traceable to the peculiar method of exhausting has not as yet been determined.

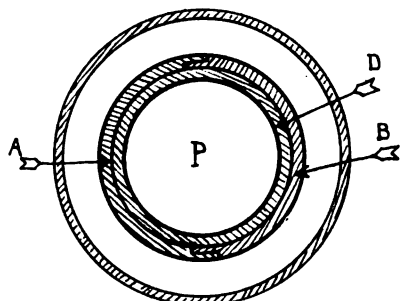
One of the newcomers in the engine starting field is the B. & S. starter, shown by the Park Supply Co., of 126 Massachusetts avenue, Boston. It is of the acetylene type, and has a particularly simple control system, consisting of a push button, which, when pressed inward, opens the valves of the gas pipes leading to the cylinders, al-

for the first time in Boston. This is the "Crankless" starter, made by the Cox Brass Mfg. Co., of Boston. In this starter the pressure of gas in the tank is depended upon to fill the cylinders when the push button on the dash is pressed, and there is a special mixing valve by means of which the gas is mixed with air in the proper proportion for the best results. Of an entirely different type is the Tudor starter, the product of J. W. Tudor, of Boston, which relies for its operation upon power stored up, while the engine is running, in heavy coil springs. Pressure on a foot button releases the spring motor, which turns the engine over three times at a rapid rate, and after the motor starts it automatically winds up the spring and automatically disengages when the winding is complete. If the motor fails to start at first the springs can be wound by hand, a crank being furnished for the purpose. The starter is bolted to the front of the car in place of the usual starting crank, and looks more ponderous than the 75 pounds which it is claimed to weigh. The Universal Safety Starter Co., Delta Building, Boston, shows a starting crank of the non-kicking type, which is thrown out of gear by a reverse movement of the motor. This is also made in bar form for marine motors. The better known "Boston" safety crank—"the crank without the kick"—is shown by Partridge & Brewster, Boston.

A system whereby the acetylene lights of the car may be lighted, extinguished and regulated wholly from the seat is displayed by the G. C. A. Mfg. Co., of Pittsfield, Mass., under the style the Grinnell gas controller and igniter. In this device there is a hand-operated controlling valve which turns on the gas at the tank, and at the same time makes an electrical contact and closes a circuit, which includes a dry battery and spark coil, with jump-spark igniters at each of the lamp burners, suitable high-tension wiring carrying the current from the coil to the lamps. The handle for operating the lighter is placed where it can be reached by the driver from his seat—on the right-hand side of the car, just in front of the gas tank. Jump-spark igniters can be furnished for the lighting of any number of lamps on the car. Another lamp lighter of the jump-spark type is the "Flash," exhibited by the Motor Specialties Co., of Boston, in which the controlling mechanism is placed on the dashboard and the gas piping and wiring led to it. Special burners are used, being made with the sparking points permanently attached, as are also the high-tension wire terminals. In both these systems a separate battery of dry cells is used, so that there is no possibility of interference with the motor ignition system. The well-known Holtzer-Cabot electric lighting system, which was shown for the first time last year, appears again without changes of any kind. Lighting and ignition batteries of the "Harvard" brand are exhibited by



K-D CYLINDER IN SECTION

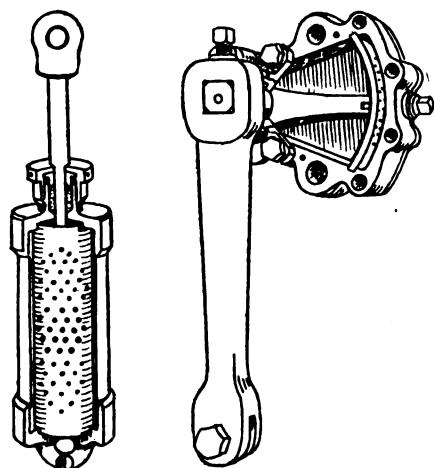


PLAN OF CYLINDER

lowing gas to flow to them until the button is released, when it closes by the action of a coil spring. The ignition is effected in the usual way. Gas will continue to flow as long as the button is held down, so that the motor may be kept turning over on acetylene as long as may be necessary. There is one other engine starter of the acetylene type which, while widely heralded previous to its appearance, is shown

the American Storage Battery Co., of Cambridge, Mass.

One brand new shock absorber, the "Knojah," made by the Knojah Shock Absorber Co., of Lexington, Mass., is in evidence, and though its hydraulic principle is by no means new, the construction of the device is ingenious. The "Knojah" is made in two forms. The piston and cylinder type has a cylinder, drilled full of holes, within a concentric chamber in an outer cylinder, the ends of which are closed. The cylinder and the surrounding chamber are filled with oil. The cylinder is attached to the axle of the car and the end of the piston rod to the frame, so that the piston is reciprocated by the movement of the car on its springs. In order to move, however, the piston must displace the oil with which the cylinder is filled, and it is the comparatively slow passage of the oil through the

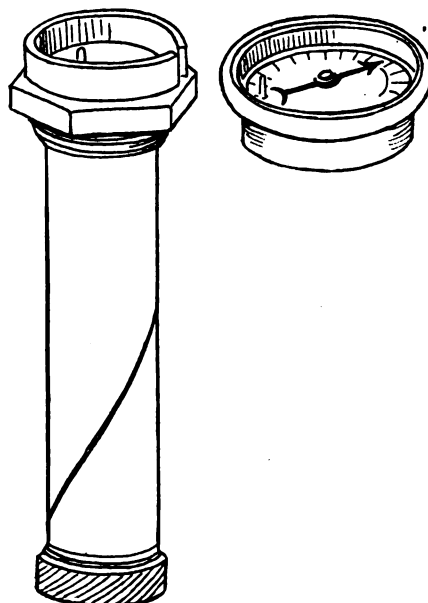


KNOJAH SHOCK ABSORBERS

holes that checks the movement of the piston and, of course, the body of the car to which it is connected. The holes in the center of the cylinder are larger than those near the ends, so that there is very little check on the ordinary spring movements. The smaller holes toward the ends cause the resistance to increase as the spring movements become wider; at the extreme ends of the cylinder there are no holes at all, and the check is absolute at these points. The "box type" "Knojah" has a radial "piston" working in a chamber of segmental form. The end of this "piston" works against a plate which is drilled after the same manner as the cylinder in the cylinder type, and the oil chamber outside of the drilled plate answers the same purpose as the outer space in the cylinder type. The Kilgore air-cushion shock absorber, the product of the Kilgore Mfg. Co., of Boston, also is shown, but it is the same Kilgore that has been on the market for many years.

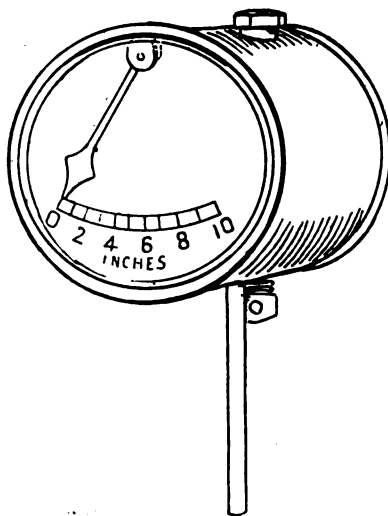
It goes without saying that the accessories exhibits include a great many that are thoroughly familiar to the show-going public. For instance, there is the Leavitt timer, manufactured by the Uncas Specialty

Co., of Norwich, Conn.; Bemus timers, in both plain bearing and ball bearing types, made by the Motor Specialties Co., of Waltham, Mass.; the Boston Auto Gage Co.'s "Triumph" magnetic gasoline tank gauges, in dashboard and tank styles; this



TRIUMPH MAGNETIC GAUGE

has not been exhibited for two or three years, though it has been on the market for some five years. It differs from other gauges in that the dial hand is operated by means of a magnet mounted at the top of a rod which is turned by the rising and falling of a float contained in a tube which



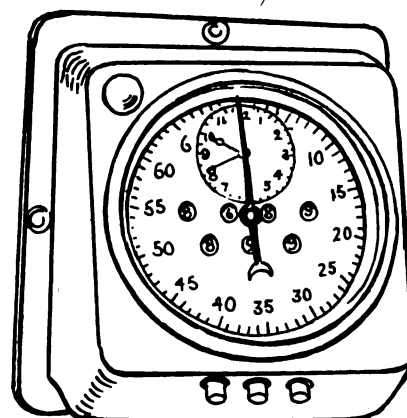
ROPER GASOLINE GAUGE

reaches to the bottom of the tank, to which the gauge is attached. Mechanical connections with the needle thus are avoided.

The Roper gasoline tank gauge, made by C. F. Roper & Co., of Hopedale, Mass., which also is indigenous to the Boston show, is a dashboard gauge with a circular glass-covered dial and a pointer that indicates the depth of fuel in the tank in inches. It is connected to the tank by cop-

per tubing leading to the regular gasoline outlet.

Four speedometers not displayed at the national shows are in evidence—the Cleveland, the product of the Cleveland Speed Indicator Co., shown by Smalley Daniels; the Stover-Lang speed-mileage meter; the Reliance, exhibited by the Reliance Speedometer Co., and the Steady Hand, product of the Hoffeecker Co.; of the four, the last three are of Boston manufacture. Whereas most of the speed indicators or speedometers now on the market indicate the rapidity of revolution of the road wheel on an arbitrary scale reading in miles per hour, both the Cleveland and the Stover-Lang are novel in that the time factor is accounted for. While the principles involved in the construction and operation of both are similar, in detail, both as to method of drive and method of indicating, they are widely divergent; the Cleveland is shaft driven and indicates the speed by



STOVER-LANG METER

virtue of the time taken to cover a set distance, the time being recorded by a chronometer incorporated in the meter design, which is true of the Stover-Lang also. The latter, however, is of square shape and is pneumatically driven, and, differing from the Cleveland, indicates the car speed by noting the distance covered in a certain time. With the Cleveland, readings are given at intervals which vary with the speed of the machine; the hand is locked on one reading until the time for the appearance of the succeeding reading, insuring freedom from vibration. With the Stover-Lang the readings appear at perfectly regular intervals; the indicator is similarly locked. The manufacturers of both of these instruments supply them in a variety of different models suitable for all sorts of service; trip and season odometers and resets are inherent in the design of both. The Reliance and the Steady Hand both are of the centrifugal force type; the care taken in the working out of the little details of design, the selection of materials, being the chief respects in which they differ. Naturally the products of such well known instrument makers as the Warner Instrument Co., The Jones Speedometer,

Stewart & Clark Mfg. Co., Veeder Mfg. Co. and the Standard Speedometer Co., are by no means concealed under bushel baskets.

The familiar question, "Why break your back pumping tires, with an engine at your elbow?" is answered by the Hartford Pump & Mfg. Co., Boston, in the Hartford gear tire pump. This is a double-acting plunger pump, in which the connecting rod is attached to the piston by means of a pin which works in a slot in the side of the cylinder; the intake valves are in the piston. The pump is intended to be driven from the magneto or water pump shaft, and a spilt gear is furnished to be placed on the shaft, to mesh with a gear permanently secured to the air pump shaft. The bracket carrying the pump can be turned to any position, so as to suit almost any possible condition likely to be encountered in making the installation. The pump will handle $1\frac{1}{2}$ cubic feet of free air per minute at 500 revolutions per minute. The Hartford pump is also made in the ordinary piston type, with a connecting rod of the gas engine form; this style has self-contained and enclosed gearing, giving a reduction of four to one. It is designed to be driven by friction from the fly-wheel of the engine.

Possibly because this is an age of "combinations," the Detroit Tool Sales Co., of 60 State street, Boston, shows an outfit that is virtually a complete blacksmith shop on a single stand. The "six-in-one" combination consists of a forge with rotary blower, anvil, vise, pipe vise, emery wheel and drill press cunningly worked together in a form that is convenient and practical. A novelty of the "first aid to the injured" class is the "Jarless" towing device—a towing chain with a hook at each end and a spring cushion in the middle to absorb shocks due to the sudden application of power when towing the "injured." T. F. Russell & Co., of 176 Federal street, Boston, exhibit this bit of equipment, and also a tool designed to minimize the unpleasantness of repairing tire chains on the road, under the name of the "Necessity" chain repair tool. While bearing a strong outward resemblance to a stout pair of end-cutting pliers, the tool is not designed for cutting, but for bending chain links, and will open or close links with equal facility.

Designed to make the removal of tires from quick detachable rims an easy matter, the "O-tak-a" tool, a new device, apparently has a life of usefulness before it. The tool is clamped to the rim and has a plunger which acts on the rings so powerfully as to make it a matter of no difficulty to remove them, even if they have become rusted in place. Tires can be removed whether the rims carrying them are on the wheels or not. The device is made in two sizes, one for tires up to four inches in diameter, and the other for tires larger than four inches. Another ingenious tire iron, designed for the same purpose but of simpler construction, is shown

by T. F. Russell & Co., of Boston, who claim that it will yank a tire off, without injuring it, in one minute.

A warning signal that the makers claim will not grate on the ear even of a musician, is produced by the new Minerva exhaust horn, made by the Minerva Hardware Mfg. Co., Minerva, O., for the multiple tones are accurately attuned so that each blast is a perfectly good musical chord. The Minerva horns are made with three and four pipes giving as many tones, for exhaust pipes of various sizes, and there are several different tone combinations to select from. The makers state that a musical chord will carry further than a discordant sound, and that the Minerva horn therefore effects a sort of combination of utility and pleasure. This horn is another of the exhibits of T. F. Russell & Co., of Boston.

The "Utility" blow-out patch, made of chrome tanned leather, with metal studs and hooks, is claimed to be the only patch of its kind in which real sole leather is used, the idea being, of course, to make the patch as durable as possible. This is shown by the Tread Co., of Endicott, N. Y.

The full list of accessories exhibitors and the wares they show is as follows:

Exhibitors of Accessories.

* Denotes exhibitors who will remain for second week.

Acme Torsion Spring Co., Boston, Mass.—Acme supplementary springs.
Adams & Co., J. Q., Boston, Mass.—Dictionaries.*
Aetna Life Insurance Co., Boston, Mass.—Insurance.
Ajax-Grieb Rubber Co., New York City—Ajax tires.*
Aluminum Solder Co. of Boston, Boston, Mass.—Aluminum solder.
American Storage Battery Co., Cambridge, Mass.—Storage batteries.
American Brass Co., New York City—Tobin bronze rods and tubing.
American Technical Society, Boston, Mass.—Publications.*
Ames Auto Jack Truck, Franklin, Pa.—Automobile jacks for garage use.*
Apple Electric Co., Dayton, O.—Aplco ignition and lighting systems.
Aristos Co., New York City—Mondex shock absorbers, Disco engine starters.*
Atlas Chain Co., Brooklyn, N. Y.—Non-skid tire chains.*
Auburn Auto Pump Co., Boston, Mass.—Ten Eyck automatic tire pump.
Autogenous Welding Equipment Co., Springfield, Mass.—Welding tools and materials.
Auto Lighting Co., Boston, Mass.—Frary lighting system and engine starter.
Auto Parts Co., Providence, R. I.—Specialties for Ford cars.
Batavia Rubber Co., Batavia, N. Y.—Batavia tires.
Baum's Castorine Co., Rome, N. Y.—Lubricants and polishes.

Bi-Motor Equipment Co., Boston, Mass.—Standard friction windshields, Speedo mixers, Black Eagle spark plugs, etc.

Blickensderfer Co., G. C., Stamford, Conn.—Bull's Eye spark plugs.

Booth Demountable Rim Co., Detroit, Mich.—Demountable rims.

Borne-Scrymser Co., Boston, Mass.—Colonial and Silex lubricants.*

Boston Safety Crank Co., Boston, Mass.—Safety starting cranks.

Boston Tire and Rubber Co., Boston, Mass.—Comet tires, liners, etc.

Boston Auto Gage Co., Boston, Mass.—"Tankascope" and Triumph magnetic gauges.

Bowser & Co., Inc., S. F., Fort Wayne, Ind.—Oil and gasoline storage apparatus.*

Boyd, F. Shirley, Boston, Mass.—R. I. V. ball bearings.

Bucklin & Co., Walter S., Boston, Mass.—Insurance.*

Burn-Boston Battery Mfg. Co., Boston, Mass.—Sealed liquid batteries.

Campbell Co., A. S., Boston, Mass.—Cello electric headlights, dome lights, etc.

Century Tire Co., Boston, Mass.—Century tires.

Champion Ignition Co., Flint, Mich.—A-C coils, timers and spark plugs.

Chandler & Farquhar Co., Boston, Mass.—Machinery, tools and machinists' supplies.

Clayton Air Compressor Works, Boston, Mass.—Garage and portable tire pumps.*

Coes Wrench Co., Worcester, Mass.—Wrenches.*

Columbia Tire and Top Co., Boston, Mass.—Tires and tops.

Connecticut Telephone and Electric Co., Meriden, Conn.—Magnetos, coils and spark plugs.

Cook's Sons, Adam, Boston, Mass.—Lubricants.

Coward Auto Supply Co., Boston, Mass.—Star speedometers, J-M shock absorbers and other supplies.

Cox Brass Manufacturing Co., Albany, N. Y.—"Crankless" engine starters, windshields and bumpers.

C. R. G. Manufacturing Co., Saugus, Mass.—C. R. G. carburetors.

Cramp & Sons Ship and Engine Building Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.*

Crane & Co., L. M., Boston, Mass.—Eureka lubricants and soaps.*

Crowell Chemical Co., Beverley, Mass.—Oxford polishes.

Cut Price Auto Supply Co., Boston, Mass.—Accessories.

Daniels, Smalley, Boston, Mass.—Vulcan springs, Boreas windshields, Cleveland speed and time indicators, Lunar lamps, etc.

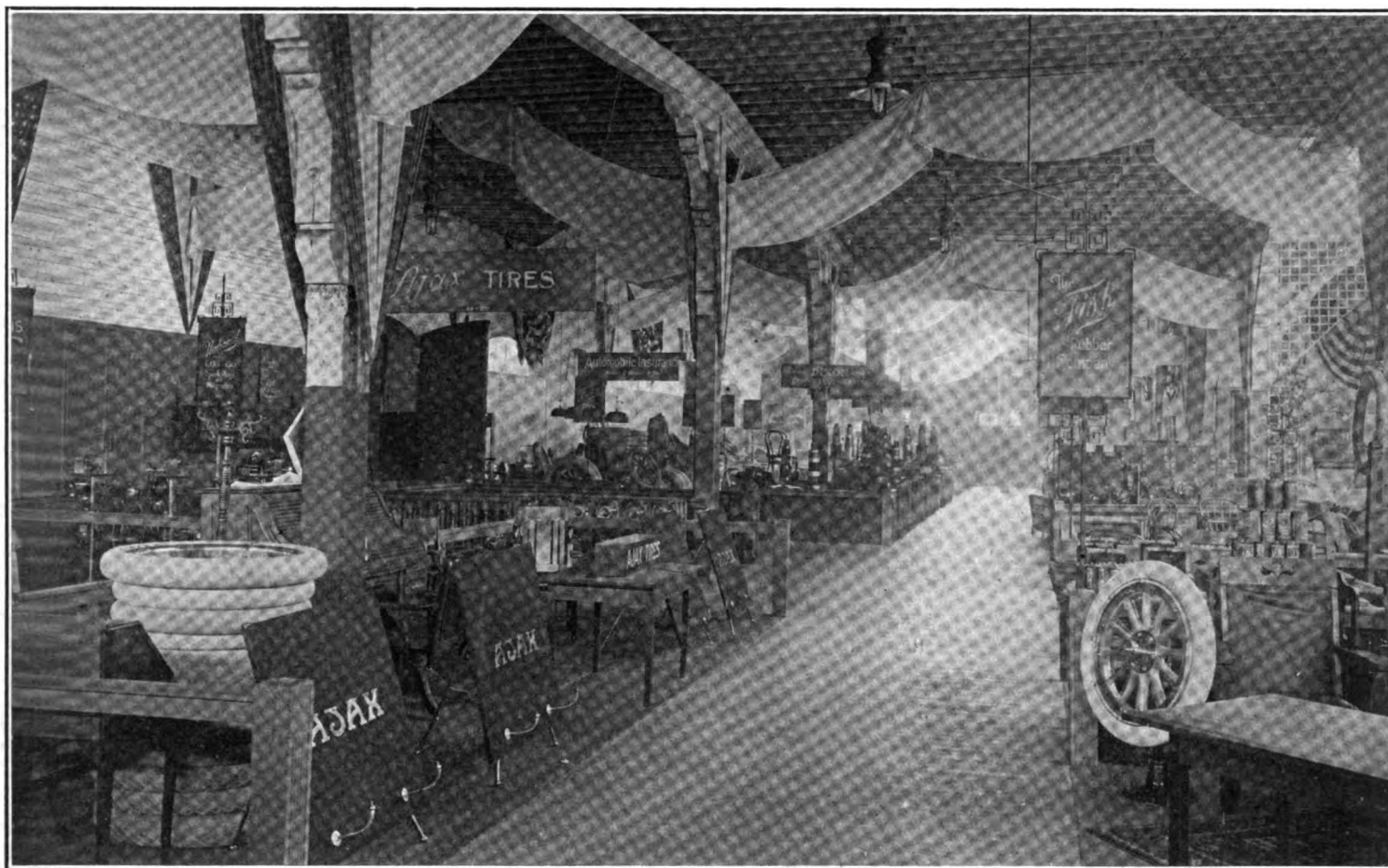
Dean Electric Co., Elyria, O.—Tuto horns and Dynalux lighting systems.*

Deane Steam Pump Co., Hoyloke, Mass.—Steam pumps.*

Davies Mfg. Co., Detroit, Mich.—Spring tires.
 Detroit Electric Appliance Co., Detroit, Mich.—Deaco ignition and lighting system.
 Detroit Tool Sales Co., Boston, Mass.—Tools.
 Diamond Rubber Co., Akron, O.—Diamond tires.*
 Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.
 Dover Stamping and Mfg. Co., Cambridge,

Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.*
 Firestone Tire and Rubber Co., Akron, O.—Firestone tires.*
 Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.*
 Fitz, Dana & Co., Boston, Mass.—Tools and machinery.
 Flentje, Ernst, Cambridge, Mass.—Hydraulic recoil preventers.
 Forbes, Walter J., Boston, Mass.—K-W ignition and lighting specialties.

Heinze Electric Co., Lowell, Mass.—Ignition and lighting specialties.
 Hillman Auto Supply Mfg. Co., Boston, Mass.—Repair work, and brass and plated specialties.
 Hofferker Co., Boston, Mass.—Speedometers.*
 Holt & Beebe Co., Boston, Mass.—Lamps and electric specialties.
 Holtzer-Cabot Electric Co., Brookline, Mass.—Lighting systems, and Newcomb carbureters.*



ONE OF THE AISLES ON THE SECOND FLOOR WHERE ACCESSORIES ARE DISPLAYED

Mass.—Drip pans, funnels and measures.
 Dorian Remountable Rim Co., New York City—Dorian remountable rims.
 Downing, C. J., New York City—Tires and supplies.
 Eagle Oil and Supply Co., Boston, Mass.—Eagleine lubricants.*
 Edison Storage Battery Co., West Orange, N. J.—Storage batteries.
 Eisner & Co., H., Boston, Mass.—Eisemann magneto.
 Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.*
 Empire Tire Co., Trenton, N. J.—Empire tires.
 Endurance Tire and Rubber Co., New York City—Tires.
 Esterline Co., Lafayette, Ind.—Matchless electric lighting and ignition systems.
 Fairbanks Co., Boston, Mass.—Machine tools.

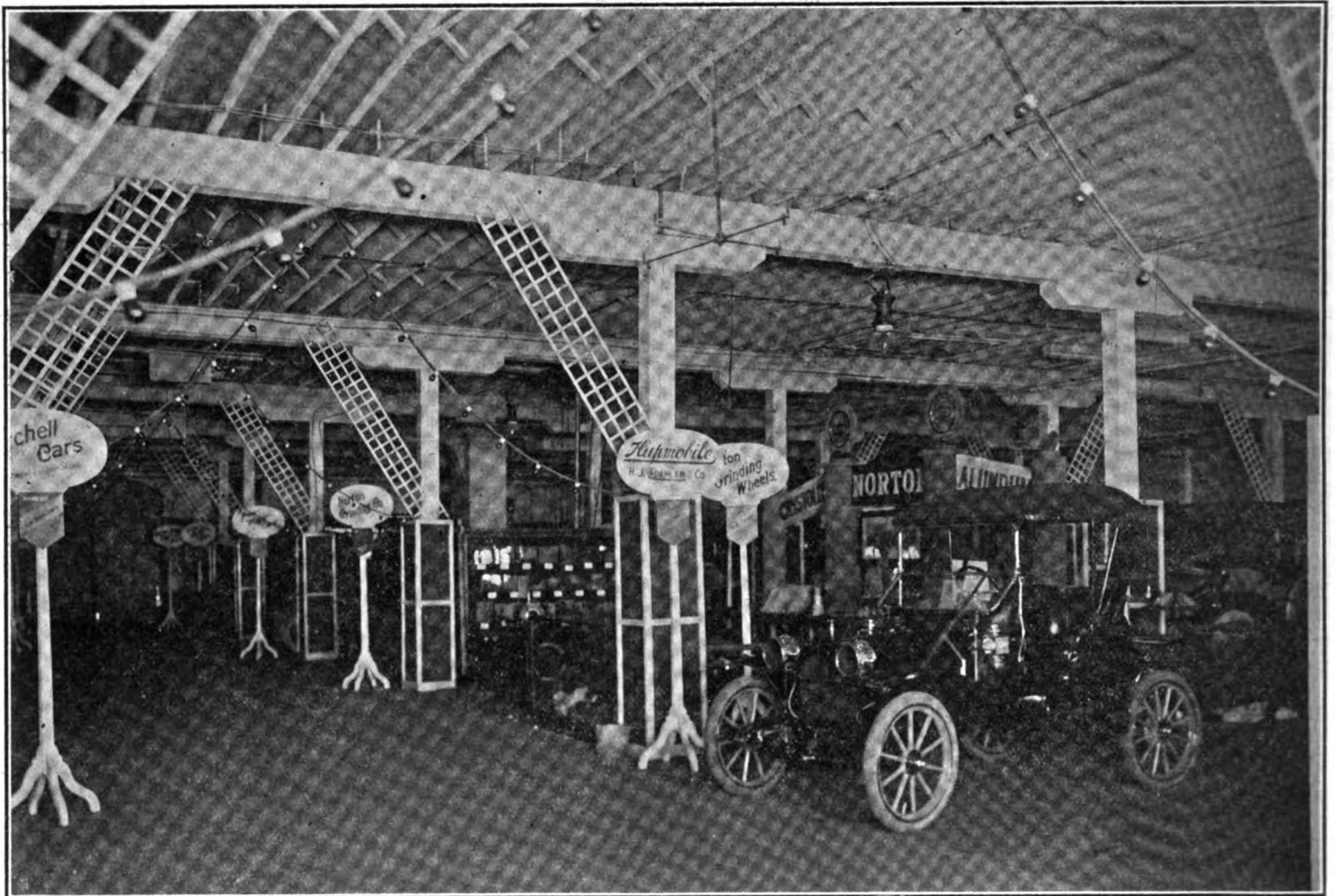
Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.
 G. C. A. Mfg. Co., Pittsfield, Mass.—Acetylene lighting systems.
 Gibney & Bro., James L., Philadelphia, Pa.—Solid tires and vulcanizers.
 Goodrich Co., B. F., Akron, Ohio—Goodrich tires.*
 Goodyear Tire and Rubber Co., Akron, O.—Goodyear tires.*
 Gray & Davis, Amesbury, Mass.—Lamps and electric lighting systems.*
 Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford auto-jacks and engine starters.*
 Haws, Geo. A., New York City—Panhard lubricants.
 Harris Oil Co., A. W., Providence, R. I.—Lubricants.*
 Havoline Oil Co., Boston, Mass.—Havoline lubricants.

Hollingshead Co., R. M., Camden, N. J.—Lubricants and polishes.
 Hopewell Bros., Newton, Mass.—Tool bags, tire covers, etc.
 Hub Cycle Co., Boston, Mass.—Tires and other bicycle and automobile sundries.
 Ideal Oil Tank and Pump Co., Boston, Mass.—Oil tanks and pumps.*
 International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.*
 International Automobile Association, Boston, Mass.—Publications.
 International Metal Polish Co., Indianapolis, Ind.—Blue Ribbon polishes.
 Jackson & Co., Boston, Mass.—Motor apparel.
 Jones Speedometer, New Rochelle, N. Y.—Speedometers and odometers.*
 Kelleher, J. J., Boston, Mass.—Typhoon horns.

Kellom & Co., Charles F., Boston, Mass.—Invader lubricants.
 Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.*
 Keystone Lubricating Co., Philadelphia, Pa.—Keystone lubricants.*
 Kilgore Mfg. Co., Boston, Mass.—Kilgore shock absorbers.
 Knight, Margaret E., Framingham, Mass.—Motors.
 Knowles, C. S., Boston, Mass.—Hartford tire pumps, Miller tires, etc.

McGuinness, J. J., Waterbury, Conn.—De Luxe glass polish.
 Michelin Tire Co., Milltown, N. J.—Michelin tires.
 Millbury Steel Foundry Co., Millbury, Mass.—Castings.*
 Miller, Charles E., New York City—Pan-American oils, Brampton chains, and supplies.
 Modern Auto Appliance Co., Chatham, N. Y.—“Little Steersman” steering device.

Motor World Publishing Co., New York City—The Motor World.
 Motz Tire and Rubber Co., Akron, Ohio—Motz tires.*
 Narragansett Chemical Co., Providence, R. I.—Meteor lubricants and storage batteries.
 National Carbon Co., Cleveland, Ohio—Dry cells.*
 National Coil Co., Lansing, Mich.—National coils and magnetos.



ONE SECTION OF THE BASEMENT IN WHICH CARS AND ACCESSORIES INTERMINGLE

Knojah Shock Absorber Co., Boston, Mass.—Knojah shock absorbers.
 Leather Tire Goods Co., Niagara Falls, N. Y.—Adjustable tire treads and non-skid bands.*
 Lee Tire and Rubber Co., Conshohocken, Pa.—Tires.*
 Leland & Co., W. H., Worcester, Mass.—Machinery.
 Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns and Raiswell jacks.
 Lunt, Moss Co., Boston, Mass.—Stationary pumping and lighting plants.*
 MacVan, John, Boston, Mass.—O-Tak-A tire tool.
 Marburg Bros., Inc., New York City—Mea magnetos.*

Moore, Smith Co., Boston, Mass.—Fur garments.*
 Morrison-Ricker Co., Grinnell, Ia.—Grinnell gloves.
 Morse, John Lewis, Franklin, Mass.—Brown's Perfection inner tubes.
 Mossberg, Frank, Attleboro, Mass.—Mossberg wrenches and bells.
 Mosler & Co., A. R., New York City—Spit-Fire spark plugs.*
 Motor Accessories, Inc., Boston, Mass.—Accessories.
 Motor Specialties Co., Waltham, Mass.—Bemus timers, Flash electric lighting systems, A B C jacks, etc.
 Motor Vehicle Publishing Co., New York City—Publications.

National Rubber Co., St. Louis, Mo.—Rubber preservative.
 National Tube Co., Pittsburgh, Pa.—Shelby seamless steel tubing.
 New York and New Jersey Lubricants Co., New York City—Columbia lubricants.*
 Norton Co., Worcester, Mass.—Grinding wheels and machinery.
 Nugget Polish Co. of New York, Ltd., New York City—Nugget polishes.
 Pantasote Co., New York City—Top materials.
 Park Supply Co., Boston, Mass.—B & S engine starters.
 Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania and Polack tires.*
 Piel Co., G., Long Island City, N. Y.—Long horns and muffler cutouts.

- Pittsfield Spark Coil Co., Dalton, Mass.—Pittsfield spark coils, magnetos and other ignition devices.
- Post & Lester Co., Boston, Mass.—Perkins electric lighting systems, Stewart speedometers, Victor gas tanks, windshields, lamps, etc.
- Pyrene Co. of New England, Boston, Mass.—Fire extinguishers.*
- Randall-Faichney Co., Boston, Mass.—Jericho exhaust horns, B-Line grease guns, etc.
- Raymond Engineering Co., Inc., Boston, Mass.—R. V. motors.*
- Reed Tire and Supply Co., Boston, Mass.—C. R. G. carburetters and Prince tires.
- Reliance Speedometer Co., Boston, Mass.—Speedometers.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting devices.*
- Republic Rubber Co., Youngstown, Ohio—Republic tires.
- Robinson & Son Co., Wm. C., Baltimore, Md.—Lubricants.*
- Rome Soap Mfg. Co., Rome, N. Y.—Soaps and polishes.
- Russell & Co., T. F., Boston, Mass.—Leavett timers, Minerva horns, Victor lamps, Q. D. tire tools, etc.
- Salman, John A., Boston, Mass.—Monograms and souvenirs.
- Seamless Rubber Co., New Haven, Conn.—Seamless tires.
- Sages Trunk Co., Boston, Mass.—Trunks.
- Sawyer Oil Co., Howard B., Boston, Mass.—Lubricants.*
- Shannon, T. R., Hartford, Conn.—Polishes.
- Shaler Co., C. A., Waupum, Wis.—Vulcanizers.
- Shawmut Tire Co., Boston, Mass.—Shawmut tires.
- S. K. F. Ball Bearing Co., New York City—Ball bearings.
- Sheldon Axle Co., Wilkes-Barre, Pa.—Sheldon axles.*
- Splitdorf, C. F., New York City—Magnetos and spark plugs.*
- Standard Auto Supply Co., Boston, Mass.—Rhineland, R. B. F. and Fafner bearings, Shaler and Imperial vulcanizers, Hoffecker speedometers, Standard lighting systems, and Deaco dynamos.*
- Standard Oil Co. of New York, New York City—Lubricants.*
- Standard Thermometer Co., Boston, Mass.—Standard speedometers.
- Standard Tire Protector Co., Akron, Ohio—Tire protectors.
- Standard Tire and Rubber Co., Boston, Mass.—Imperial and Standard tires.
- Standard Wrench and Tool Co., Providence, R. I.—Wrenches and tools.
- Standard Woven Fabric Co., Worcester, Mass.—Multibestos brake lining.
- Steel Cushion Tire Co., New York City—Spring wheel.
- Stewart & Clark Mfg. Co., Boston, Mass.—Stewart speedometers.
- Stover-Lang Co., Boston, Mass.—Speed and mileage meters.
- Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.
- Swinehart Tire and Rubber Co., Akron, O.—Swinehart tires.*
- Texas Co., New York City—Lubricants.
- Tingley & Co., C. O., Rahway, N. J.—Plugs, patches and cement.
- Tobey, Wm. L., East Boston, Mass.—Q. D. rim removers.
- Townsend & Co., S. F., Orange, N. J.—Townsend grease gun.
- Tudor, John W., Boston, Mass.—Engine starters.
- United Rim Co., Akron, Ohio—Demountable rims.*
- U. S. Light & Heating Co., New York City—Storage batteries.*
- U. S. Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.*
- Universal Safety Starter Co., Boston, Mass.—Universal engine starters.
- Utility Tread Co., Endicott, N. Y.—Utility blow-out patches.
- Vacuum Oil Co., Boston, Mass.—Lubricants.*
- Valentine & Co., New York City—Paints and varnishes.
- Valvoline Oil Co., Edgewater, N. J.—Lubricants.
- Veeder Mfg. Co., Hartford, Conn.—Speedometers, odometers, die castings, etc.*
- Vesta Accumulator Co., Chicago, Ill.—Lamps and storage batteries.
- Voorhees Rubber Mfg. Co.—Tire sleeves, plugs and patches.
- Waltham Watch Co., Boston, Mass.—Clocks.
- Ward & Sons, Edgar T., Boston, Mass.—Tubing and tools.
- Warner Instrument Co., Beloit, Wis.—Warner autometers.
- Weed Chain Tire Grip Co., New York City—Anti-skid chains.
- Wheeler & Schebler Co., Indianapolis, Ind.—Schebler carburetters.
- White & Bagley Co., Worcester, Mass.—Oilzum lubricants.
- Winship, W. W., Boston, Mass.—Trunks, grips, toilet sets, etc.
- Wolverine Lubricants Co., New York City—Lubricants.

Commercial Vehicles That Will Replace the Cars at Boston Show

For the first time in its motor car show history Boston is to have an exhibition of commercial motor vehicles that will be entirely separate from the pleasure car show, though it will be held in the familiar old Mechanics' Building, where the more sprightly and less sober-sided passenger-carrying vehicles now hold the stage and will continue to do so until the end of this week. That twin brother of the Boston Automobile Dealers' Association, the Boston Commercial Vehicle Association, this year has launched out on its own hook, and its show will be opened on Wednesday, March 13th, three days after the doors of the big building have closed on the last of the pleasure cars, and will last until the end of the week. Chester I. Campbell, who is secretary and manager of the Boston Commercial Vehicle Association, as well as of the pleasure car organization, will continue to lead the strenuous life for a while, for he will manage the exhibition of business cars, too, in addition to managing the show that is "now going on."

Of course it is impossible to say what new arrivals may be disclosed at the eleventh hour, but the list of exhibitors, as it stood at last reports, is as follows:

- Anderson Motor Vehicle Co., Detroit, Mich.—Detroit electric.
- Atterbury Motor Truck Co., Buffalo, N. Y.—Atterbury.
- Autocar Co., Ardmore, Pa.—Autocar.
- Baker Motor Vehicle Co., Cleveland, Ohio—Baker electrics.
- Bennett & Co., P. G. H., Boston, Mass.—Boston Motor Co., Boston, Mass.—
- Buick Motor Co., Flint, Mich.—Buick.
- Butler Motor Truck Co., Boston, Mass.—Rapid.
- Chase Motor Truck Co., Syracuse, N. Y.—Chase.
- Clark, Edw. S., Dorchester, Mass.—Clark.*
- Commerce Motor Car Co., Detroit, Mich.—Commerce.
- Couple Gear Freight Wheel Co., Grand Rapids, Mich.—Couple gear.*
- Curtis-Hawkins Co., Boston, Mass.—Speedwell.
- Dayton Auto Truck Co., Dayton, Ohio—Dayton.
- De Dion-Bouton, France—De Dion-Bouton.*
- Decatur Motor Car Co., Cambridge, Mass.—Decatur Hoosier.
- Dodge Motor Vehicle Co., Cambridge, Mass.—Pope-Hartford.
- Eastern Motor Truck Co., Cambridge, Mass.—Kelly.
- Eckhard Motor Truck Co., Boston, Mass.—Eldridge, W. E., Boston, Mass.—
- Federal Motor Truck Co., Detroit, Mich.—Federal.
- Ford Motor Co., Boston, Mass.—Ford.
- Fuller, Alvan T.—Packard.
- Garford Co., Elyria, Ohio—Garford.
- General Motors Truck Co., Boston, Mass.—G. M. C.
- Grabowsky Power Wagon Co., Detroit, Mich.—Grabowsky.
- Hanson Bros., Boston, Mass.—
- International Harvester Co. of America, Somerville, Mass.—International.
- Kissel Kar Co., Boston, Mass.—Kissel.

Knox Automobile Co., Springfield, Mass.—Knox.
 Lansden Co., Newark, N. J.—Lansden electric.
 Lauth-Juergens Motor Car Co., Fremont, Ohio—Lauth-Juergens.
 Linscott Motor Co., Boston, Mass.—Reo.
 Lippard-Stewart Motor Car Co., Buffalo, N. Y.—Lippard-Stewart.
 Locomobile Co. of America, Boston, Mass.—Locomobile.
 Lozier Motor Co., Boston, Mass.—Lozier.
 MacAlman, J. H., Boston, Mass.—Commer.
 Mack Motor Truck Co., Boston, Mass.—Mack.
 McCreary, Lewis S.—
 Mercury Mfg. Co., Chicago, Ill.—Mercury.
 Morgan Motor Truck Co., Worcester, Mass.—Morgan.
 Packard Motor Car Co., Detroit, Mich.—Packard.
 Peerless Motor Car Co., Boston, Mass.—Peerless.
 Phelps, Frank N.—Baker electric.
 Philadelphia Truck Co., Philadelphia, Pa.—Philadelphia.*
 Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Pierce-Arrow.
 Poss Motor Co., Detroit, Mich.—Poss.
 Reo Motor Car Co., Lansing, Mich.—Reo.
 Sanford-Herbert Co., Syracuse, N. Y.—San-herbert.
 Schlotterback Mfg. Co., L. E., East Orange, N. J.—Koehler.
 Smith, R. L. & H. H., Boston, Mass.—Mais.
 Speedwell Motor Car Co., Dayton, Ohio—Speedwell.
 Standard Motor Truck Co., Boston, Mass.—McIntyre.
 Stanley Motor Carriage Co., Newton, Mass.—Stanley Steamer.*
 Sternberg Mfg. Co., Milwaukee, Wis.—Sternberg.
 Stearns Co., F. B., Cleveland, Ohio—Stearns.
 Stevens, Chas. H., Atlantic City, N. J.—Sandusky.
 Teel Mfg. Co., Bedford, Mass.—Teel.*
 Underhill Co., Boston, Mass.—Knox.
 Universal Motor Truck Co., Detroit, Mich.—Universal.
 United Motor Boston Co., Boston, Mass.—Sampson.
 Velie Motor Vehicle Co., Boston, Mass.—Velie.
 Victor Motor Car Co., Boston, Mass.—Victor.
 Walker Vehicle Co., Boston, Mass.—Walker.
 White Co., Boston, Mass.—White.
 Whitney-Barney Co., Boston, Mass.—Gramm.
 Whitten-Gilmore Co., Boston, Mass.—Dayton and Federal.

The Denver show did not open on March 4th, according to schedule. For various reasons, the dates of the show were changed to March 12th to 16th. It will be staged in the Auditorium.

PARADE PRECEDED ELMIRA'S SHOW

After Townspeople Were Awakened, the Doors Were Thrown Open—Representative Display of Cars in Evidence.

Nothing, not even an automobile parade, red fire and a band wagon large enough to hold Hager's Military band, tuba and all, was spared to make the Elmira (N. Y.) automobile show a success. The parade comprised some 60 cars, most of the owners being members of either the Elmira Automobile Club or the Elmira Automobile Dealers' Association; under whose auspices the event was held in the State Armory during the week February 27th to March 2nd. In and around all the principal thoroughfares of the progressive town, with alternate periods of sublime music and open muffler cutouts and "honk, honk" accompaniments, the caravan paraded until promptly at eight o'clock it reached the Armory, and the show was officially opened.

Parade and red fire, however, did not constitute the show. Automobiles there were in plenty, some 27 different makes of all varieties, both pleasure and commercial vehicles, staged by 18 exhibitors; in the necessary department anything of any possible use to the motorist, from an insurance policy to an automatic engine starter, could be seen at the booths of the dozen dealers. As was to be expected, Elmira's home product, the Hatfield delivery wagon, a light machine made by the Hatfield Co., was very much in evidence.

Neither were decorations lacking. The ceiling beams as well as the side walls of the drill hall were artistically draped with bunting in the colors of the Automobile Club; festoons of electric incandescents supplied the added illumination needed to show off the cars to the best advantage, while the exhibitors' booths were structures entwined with smilax. The complete list of exhibitors is as follows:

A. M. Zimbrich, Stoddard-Dayton, Haynes, Flanders electric and Gramm truck; Hatfield Co., delivery wagons; Cutting Auto Sales Co., Cutting; Wheat & Wheeler, Van Dyke delivery car; La France Garage, Chalmers, Reo and Hupmobile; Southern Tier Motor Car Co., Franklin, Peerless and Overland; Strong & Gates, E-M-F and Flanders; R. H. Wickwire, R. C. H.; Genesee Motor Car Co., Cadillac; F. E. Smith, Warren; Bishop Co., Buick; Chemung Motor Car Co., Oakland, Oldsmobile, Hudson and Marion; John F. Rhodes, Krit; Wolcott Motor Car Co., Pierce-Arrow; E. C. Crane, Winton and Maxwell; F. Wrayburn Keeton, Rambler; Electric Garage, Detroit electric; Bishop & Whitney, Ford.

Accessories: Meyer Bros., Ivory novelties; Wayne Oil Tank and Pump Co., oil and gasoline storage apparatus; Hollings-

head & Co., Whiz polish; F. A. Hilliker, O-Tak-A tire wrench; W. D. Barron, Hanna engine starter; Hallock & Bro., automobile clothing; Barker, Rose & Clinton, accessories; F. C. Tomlinson, insurance; Standard Oil Co., lubricants; Frontier Specialty Co., spark plugs; P. R. Rutan & Son, Indian, Excelsior and Merkel motorcycles; George F. Ellis, Pierce motorcycles.

American Cars in Swedish Contest.

No primrose paths marked the route of the Swedish Royal Automobile Club's annual reliability tour, which occurred February 4-10, and in which several American cars participated. February is the severest winter month in Sweden, and rigorous conditions prevailed. The route this year, as for six years past, led from Stockholm to Gothenburg; but the participants were compelled to return over the same route instead of going only one way, making it 1,000 kilometers (600 miles) long, through snowdrifts and over icy roads that would discourage most owner-drivers.

There were 43 entrants, representing nine countries, the United States being very much in evidence with a Cadillac, Pope-Hartford and Maxwell in Class A, and four Fords, one Overland, one Buick, one Flanders and one Maxwell in Class B. The tour started while the thermometer hovered at 17 below zero, and despite the four inches snow many of the cars came through without penalties. The winners in Class A were: First, Opel; second, Vauxhall; third, Mathis; fourth, Minerva; fifth, Cadillac; sixth, Vivinus. In Class B the winners were: First, NAG; second, Buick; third, Overland. In the speed trials on the ice, following the tour, the American cars—Ford, Maxwell, Cadillac and Buick—gave a good account of themselves, covering the kilometer in 52, 44.6, 47 and 49 seconds, respectively.

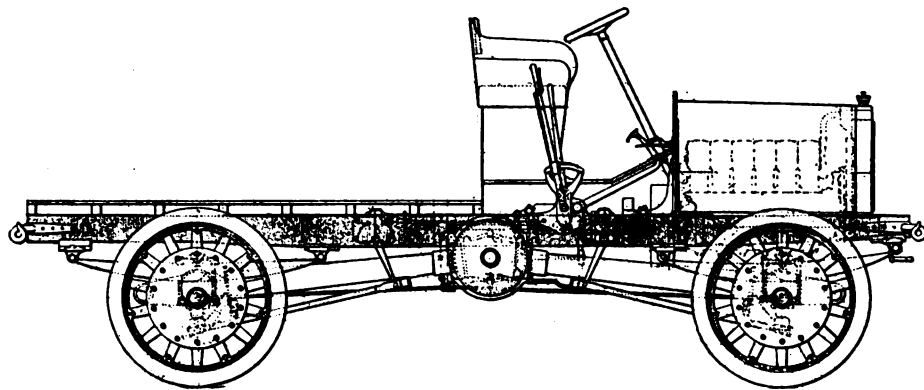
Moross Draws a Sixty-Day Sentence.

E. A. Moross will promote no racemeets for 60 days at least. For at the last meeting of the Contest Board of the American Automobile Association, held on the 29th ultimo, he and his agent, W. H. Wellman, were disqualified and suspended "to and including April 20th, 1912, for violation of Rule 21 of the Contest Rules." The trouble grew out of a racemeet which Moross proposed to hold on the track of the Crescent City Jockey Club, in New Orleans, February 17th and 18th. Formal application for a sanction was made to the Contest Board and both the sanction and the dates were allowed. Subsequently, entry blanks were issued and the contests advertised, but in violation of the rules, Moross's agent, Wellman, "canceled and abandoned the meetings without obtaining the consent of the Contest Board and without furnishing the Board with specific or satisfactory reasons therefore." In consequence, both Moross and Wellman will have opportunity to cool their heels for a period of 60 days.

PANHARD'S SIX-CYLINDER TRACTOR

Has Four-Wheel Drive, Centrally-Located Differential and Other Radical Features—Its Remarkable Efficiency.

It is indisputable that the freight transportation problem almost daily is becoming of greater importance, and those who have been in a position to watch developments in America and abroad during the past few years and to feel the pulse of the motor truck industry cannot fail to have remarked the increasing attention which foreign engineers are bestowing on the tractor and the road train as the most likely solution.



NEW PANHARD SIX-CYLINDER TRACTOR IN ELEVATION

All over Europe, and in England in particular, road trains, headed by great, lumbering steam tractors, are a common sight, and statistics prove that they are profitable investments, that slow speed and large loads are the factors which make for least depreciation, and therefore permit the placing of the largest amounts on the credit side of the ledger.

That it is not so in America is well known, of course; that it would require an exceedingly fine-toothed comb to locate a single road train on the roads of the United States is a matter which scarcely requires speculation; and the reason for the remarkable dearth is very nearly as plain as the dearth itself: In the first place, the roads are not such as will warrant the use of tractors and trailers, and, in the second place, it is a question whether the average American manufacturer would be satisfied with the slow speeds which are necessary. Again, statistics prove that in nine cases out of ten excessive depreciation and the consequent wrecking of the most careful fabric of organization and maintenance may be traced directly to overspeeding and overloading. With the properly designed road train neither of these is probable, and the possibility of either is greatly reduced.

The tractor idea gradually is sinking into the American mind, however—there was ample evidence of the fact at any one of the recent commercial vehicle shows—though it has been left to foreign engineers to de-

velop the movement to its present stage. It is not unlikely that in the future American roads may bear quite as many road trains as do foreign roads, but it will be in the far distant future, and it is only fair to add that the greatest reason for the slow progress lies not with the manufacturers but with the government; the answer is: poor roads.

In the meantime—and quite recently—added impetus has been given the movement abroad by the introduction of a tractor of the heavy duty type from the works of Panhard & Levassor, a tractor which is radically different from all others of the type, and one which incorporates a sufficient number of absolutely unique features to make it worthy of considerably

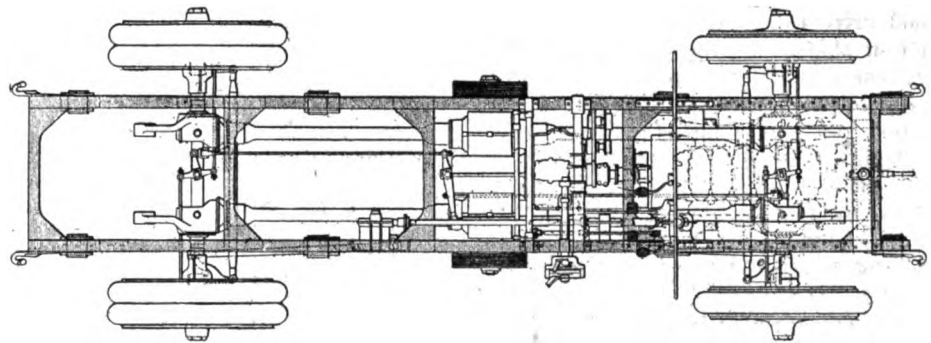
more than passing notice. It probably is the most complicated vehicle of its kind extant, but, despite this apparent drawback, recently completed tests have proven that, by reason of careful design and excellent workmanship, the efficiency of the

has gone before—either in this country or abroad.

In general appearance there is little to suggest the vehicle's inherent radicalism. The motor is located forward under a hood, after the manner of a great many American trucks, and the driver sits behind it on a high seat. The steering wheel is at the right, as are emergency brake and change speed levers, the remainder of the control mechanism consisting of the usual clutch and brake pedals and an accelerator pedal. Almost exactly half of the chassis space thus is occupied by the engine and the driver's seat, though this is of little moment, as the vehicle is intended primarily as a tractor and is not built to carry a great amount of load itself.

The motor follows closely the general lines and construction which have been perpetuated in previous Panhard vehicles of both the pleasure and commercial type, except that it is unusually sturdy, as becomes a mechanism which is to perform heavy duty. It is of the T-head type, with the cylinders cast separately, and the bore and stroke are 100 mm. and 140 mm., respectively (3 15-16x5 1/2 inches). Indicative of the care which has been used in designing, the crank shaft has seven bearings. At 1,000 revolutions a minute the rated horsepower is 35, and at 1,400 revolutions it is 45. Water cooling is employed to maintain the cylinders at the proper working temperature, the system embracing an extra large radiator, a fan and a centrifugal pump.

Power is transmitted from the engine through a multiple disk clutch and a change gear mechanism, which is another of the unusual features of the vehicle, inasmuch as it provides four speeds and reverse, se-



PLAN VIEW OF PANHARD TRACTOR SHOWING UNIQUE DRIVE

whole mechanism is not short of remarkable.

The uncommonness of the vehicle commences at the hood, which houses a six-cylinder motor—a not altogether unheard of application of the six-cylinder motor, though it is uncommon enough almost to be a curiosity—and extends clear back to the rear axle. All four wheels of the vehicle are driven and all are steered, and, though this feature in itself is not uncommon, both the method of drive and the method of steering are unlike anything that

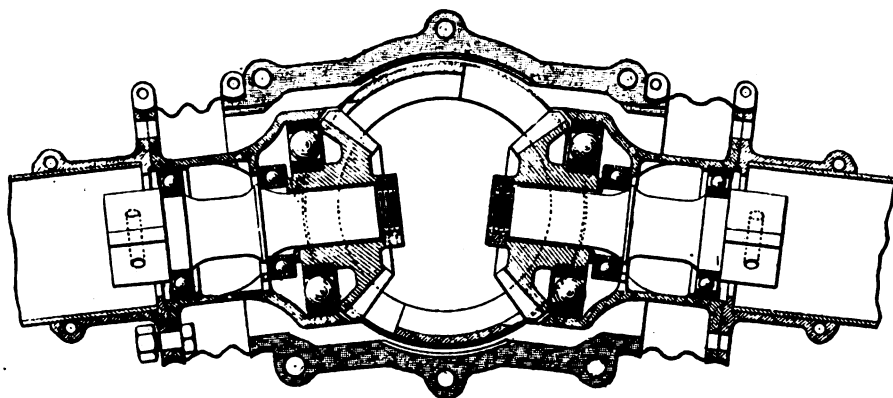
lectively obtained. Calculating the normal speed of the engine at 1,000 revolutions a minute, the vehicle is geared for approximately 12 miles an hour on high gear; at the same engine speed the three other gears give 8, 4 1/2 and 2 miles an hour, respectively. Still further increasing the utility of the vehicle, it is equipped with a winch operated from the change gear mechanism by means of a worm gear. The winch permits a cable to be hauled at the rate of two miles an hour, and gives a tractive effort of some 8,000 pounds. Thus, if the vehicle

should by any chance get stuck, though there are elaborate precautions against such an occurrence, it could pull itself almost out of a morass by its own power.

The most peculiar part of the vehicle, however, lies in the transmission elements, of which the differential mechanism is radical and original and unique. Though other four-wheel-drive trucks have employed as many as three differentials, one for each axle and one between the front and rear axles, the Panhard truck employs but the one, which takes the place of all the others. The construction of the differential, which is best made plain with the help of the accompanying illustration, is such that the

half is located behind it. The two halves are connected by means of a crank mounted directly on the axle, which, by the way, is dead. The turning radius of the vehicle is a circle 27 feet in diameter.

The method of retarding the vehicle has been particularly well worked out. In addition to the usual engine brake which is fitted to all Panhard commercial vehicles, there are also two powerful contracting brakes operating on the ends of the transverse differential shaft. These are actuated by means of the brake pedal and another set of brakes, also of the contracting type, are located on all four wheels and are operated by means of a long hand lever.



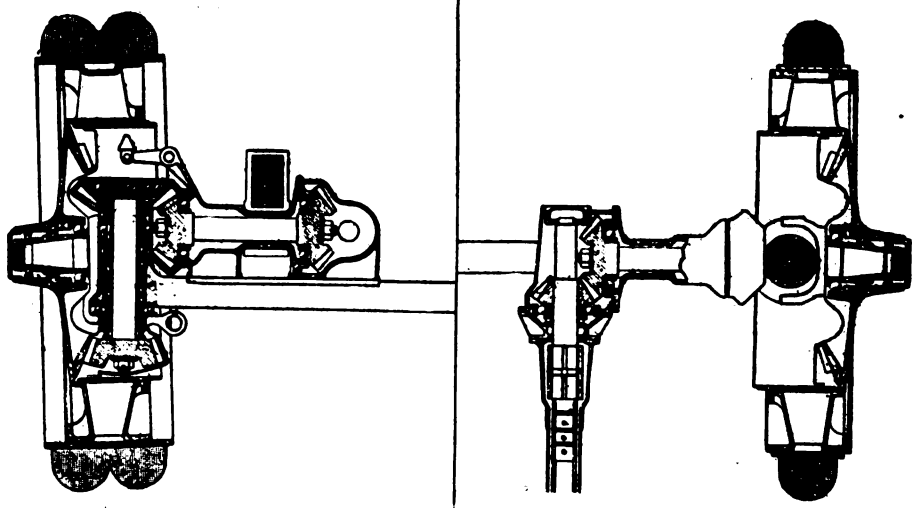
CONNECTION BETWEEN LONGITUDINAL SIDE SHAFTS AND DIFFERENTIAL

operation of all four wheels positively is synchronized while the vehicle is traveling over perfectly smooth and level roads in a straight line. At the same time, the tractive effort of the four wheels is equalized when the tractor is passing over uneven ground or when it is turning. A differential lock also is fitted for use in case both wheels on one side become locked.

Final drive to the wheels is by no less than four shafts, one for each wheel. The shafts enter the differential at each side and are so carried on the chassis and the axle that the movement of the axle cannot disturb their proper relationship. A certain amount of flexibility is permitted, however, as is but natural, and expends itself in a slight amount of movement between the differential bevels and those on the shafts. At the wheel ends of the drive shafts the arrangement is equally ingenious, and embraces the use of no less than three pairs of bevel pinions for each wheel, the method of construction being pictured in the accompanying sectional drawing.

In steering the vehicle, all four wheels are turned at once by means of the single steering wheel, the arrangement of the steering linkage mechanism being such that the wheels on each side follow always in the same track. In order to obtain this desirable feature and at the same time insure the proper turning angle of each pair of wheels, the usual tie rod has been slightly modified. Half of each, there being one for each pair of wheels, is located ahead of its respective axle and the other

The weight of the vehicle alone is four tons, and its rated carrying capacity is two tons, bringing the weight of the loaded tractor up to six tons. The chassis is car-



METHOD OF DRIVE TO REAR AND FRONT WHEELS

ried on semi-elliptic springs both front and rear, and after exhaustive tests to determine the most suitable material for traction, solid rubber tires were adopted as giving the greatest possible road adherence under all conditions. Single tires are used in front and dual tires in the rear.

As regards the performance of the tractor, recent tests have demonstrated that it is nothing short of remarkable, the total efficiency of the whole mechanism work-

ing out at 60 per cent. Under service conditions, and carrying a little over $5\frac{1}{2}$ tons, the tractor climbed a 4 per cent. grade on high gear at the rate of 12 miles an hour. On third speed, and at the same rate, an 8 per cent. grade was climbed. As an indication of the really tremendous tractive effort which is developed, a 15-inch curb was climbed on third speed, and later a 16-inch tree trunk was surmounted on the same speed without difficulty.

Further tests calculated to bring out the towing ability of the tractor demonstrated that with a trailer loaded and weighing, complete, 6 tons, a 28 per cent. grade could be negotiated on first speed quite easily; towing the same load a 9 per cent. grade was climbed on second speed. On subsequent trials, and towing two trailers weighing, complete, 10 tons, a 9 per cent. grade was climbed on first speed, and a 4 per cent. grade on second speed—in both cases, it is claimed, the ascent being made at the rate of 12 miles an hour.

Amusing Difficulties of Advertising.

In reaching out for export trade with full page advertising in the newspapers of South America, Australasia, South Africa and several other countries, the Studebaker Corporation experienced some unexpected, and, from the American standpoint, amusing obstacles. Practically none of the papers selected for use has on file at any of the big advertising agencies a rate for page copy. Advertising on this scale was unknown to them. Even on specific requests for such a rate, the publishers invariably

misunderstood and insisted on quoting rates on smaller quantities of space. One of the papers refused the advertisement, because it was too large. Another insisted on payment in advance, in order to secure money to pay compositors to set it. It was finally necessary to cable a foreign advertising expert, who came all the way from London to undertake the work of placing the business. The page appeared almost simultaneously in about 175 cities.

GRADES AND METHODS OF MEASURING THEM

The Prevalence of Exaggerated Ideas as to the Steepness of Hills That is Responsible for Numerous "Fish Stories"—Simple Systems Available Whenever Boasters Boast or Disputes Arise.

"How steep was that hill?"

The question is frequently asked, and the answer is a random guess nine times out of ten. Should the question be How far, or How fast, the answer, in nine

and "let it go at that." And right or wrong, contradiction is unlikely.

While it is not very difficult, after a little practice, to make a fairly accurate estimate of a moderate grade, such as will ordinarily be found in city streets, it is a very different matter to stand at the foot—or, for that matter, at the top—of a really stiff hill and make a good guess at it. A grade that is really a "20 per cent. hill" is a mighty stiff ascent, and to one unaccustomed to such slopes looks like something akin to a bluff. It may give an idea of the scarcity of 20 per cent. grades to state, on the authority of the New York City engineers, that there is not a 20 per cent. hill in the whole length and breadth of Greater New York. The nearest approach

traffic, and the street cars that run on it sometimes slide down with their brakes set, so a watchman is stationed at the foot with a flag to give warning when a car is coming down. This hill has a grade of about 17 per cent., but is often called anything from 25 to 40 per cent.; if it was just a little steeper it would be impracticable for the use of horse traffic of any kind, as well as for electric cars except under the most favorable conditions—with rails dry and sanded and brakes in first class condition.

A very curious thing about this matter of grades is that a 20 per cent. grade, or any grade, for that matter, looks much more inoffensive and harmless when laid out on paper in the form of a diagram than in actuality—especially if it is to be climbed with a car having a "weak heart." Similarly, a hill viewed from the side, the observer standing at a little distance, does not look nearly as formidable as from either top or bottom.

While it is usual in the United States to measure a grade according to the number of feet it rises in a horizontal distance of 100 feet, it is not uncommon for this percentage of rise to be confused with angular degrees. There really is a great deal of difference between the two. The difference is perhaps best brought out by a comparison of figures. For instance, a 10 per cent. grade is equivalent to an angle of 5 deg. 43 min.; a 20 per cent. grade is 11 deg. 19 min., and when the slope of any mountain side reaches the terrific pitch of 100 per cent.—no road would ever dream of such a thing—it is the same thing as 45 degrees.

There is still another way of specifying how steep a hill is, and that is by referring to the number of units of horizontal distance as compared to one unit of rise. This method, which is the one commonly used in Great Britain, is a good like the Ameri-

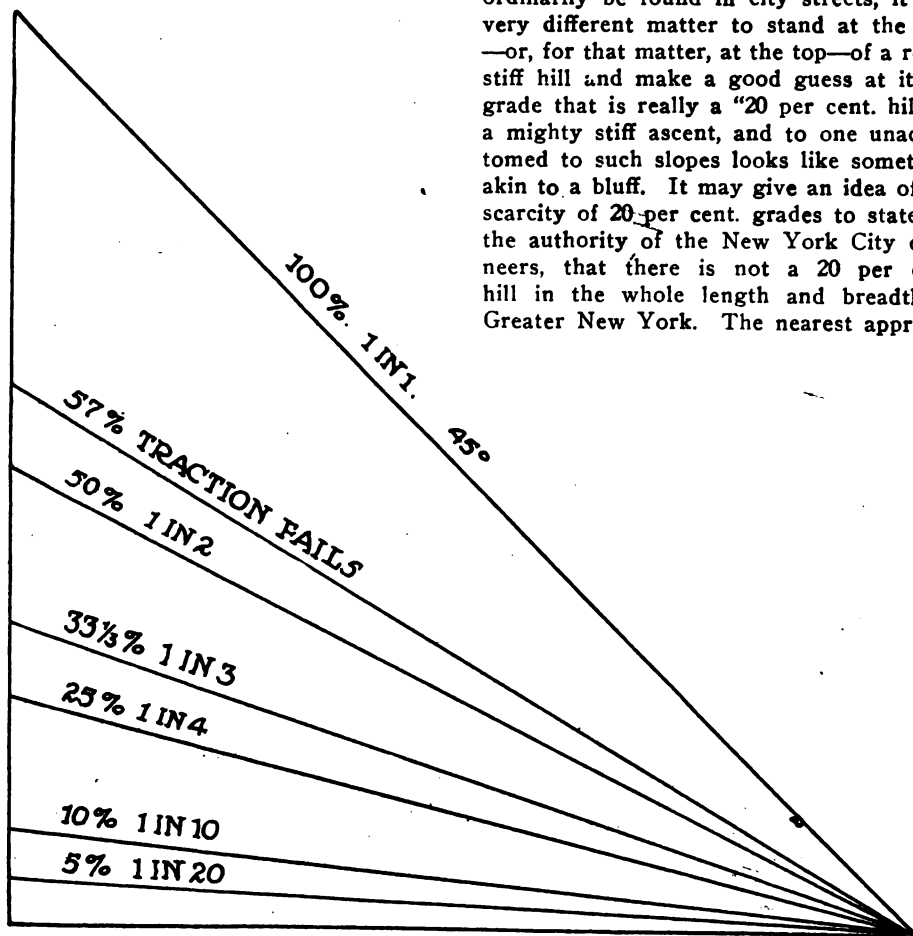


FIG. 1. TWO COMMON METHODS OF GRADE INDICATION

cases out of ten, would be correct to a dot, thanks to the common use of instruments for measuring speed rates and time; the quantity of gasoline in the fuel tank, the amount of oil in the lubricator, the energy remaining in the battery—all these things can be accurately ascertained at any time, without any particular difficulty, thanks to the inexpensive and practical meters and gauges manufactured for such purposes. But though there are instruments made for the measurement of grades, they do not seem to be in common use, for some reason, and though hills doubtless are surveyed and their ascending angles measured, the figures do not seem to be commonly known, for the fact remains that it is usually the custom to make a more or less wild guess at a grade

to it is a hill on Nicholas avenue, Staten Island, which measured up as a 19.2 per cent. grade—and looks as steep as the roof

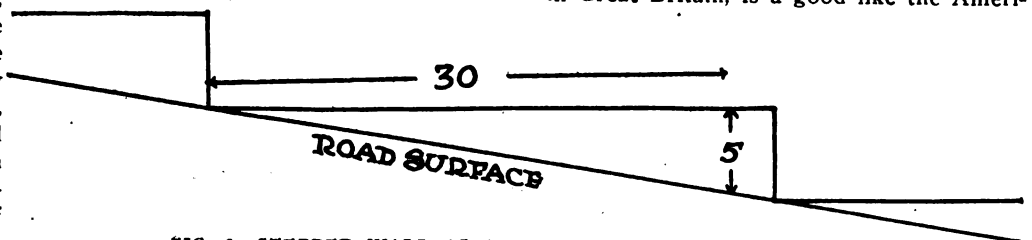


FIG. 2. STEPPED WALL AS AN AID TO GRADE MEASUREMENT

of a house. Probably the next in rank is the famous hill on Lexington avenue, between 101st and 102nd streets, known as "Paddy's Bluff" or "Coogan's Hill," which is so steep that it rarely is used by horse

can percentage basis, except that in the latter the horizontal distance is invariably assumed to be 100 feet, while in the British system the rise is constant while the horizontal distance is varied. For instance, a

the car on the hill, tie a plumb-line—which may be a piece of string with a stone on the end of it—to something on the side of the car where it can swing, and make a mark at some point touched by the string so that a line drawn from the point of attachment of the string to the mark will indicate the position of the string. When the car is again on a surface that is known to be level, attach the plumb-line at exactly the same point and let it hang as before. It will hang vertically, of course, and the distance between the points touched by the plumb-line on the hill and on the level, measured horizontally, divided into the length of the string from the point of attachment to the horizontal line when the car is standing level, will give the grade; the principle is exactly the same as in the previous instances, except that the triangle is upright instead of horizontal. Fig. 3 shows clearly how this is done. The point of attachment is at C and when on the hill the string touching the runningboard at A. On level ground the string made contact at B. The distance from B to C is divided by the distance from B to A. If the string is 30 inches long from C to B, and the distance from B to A is 5 inches, the grade will figure out $16\frac{2}{3}$ per cent., or one in six, according to the method that is used in indicating the steepness of hills on the other side of the "herring pond."

It is by no means a difficult matter to make an instrument that will indicate grades quite accurately. A flat piece of board with a free-swinging pendulum and a scale carefully marked off is all that is necessary. The pointer should be so set that when the car is standing on level ground and the instrument is placed, say, on the running-board, the pointer will stand at C. Scales can be marked off both ways from the center so that both ascending and descending grades can be read—or the same object can be attained by reversing the instrument.

A meter of this kind is very easily made, and a few trials with it on grades will in many cases cause a radical revision of answers to the query, "How steep was that hill?"

Simple Form of Charging Apparatus.

A simple form of chemical rectifier for charging storage batteries from an alternating current source is made by placing a plate of aluminum and a plate of lead in an electrolyte consisting of two quarts of water in which have been dissolved two tablespoonfuls of washing soda and three of alum. The metal plates should be one-sixteenth of an inch in thickness; the aluminum plate should have an area of 15 square inches and the lead plate 25 square inches. The apparatus works on a pressure of 15 volts; for higher voltages the use of several rectifier cells connected in series, or a suitable transformer lampboard, or rheostat, is essential, of course.

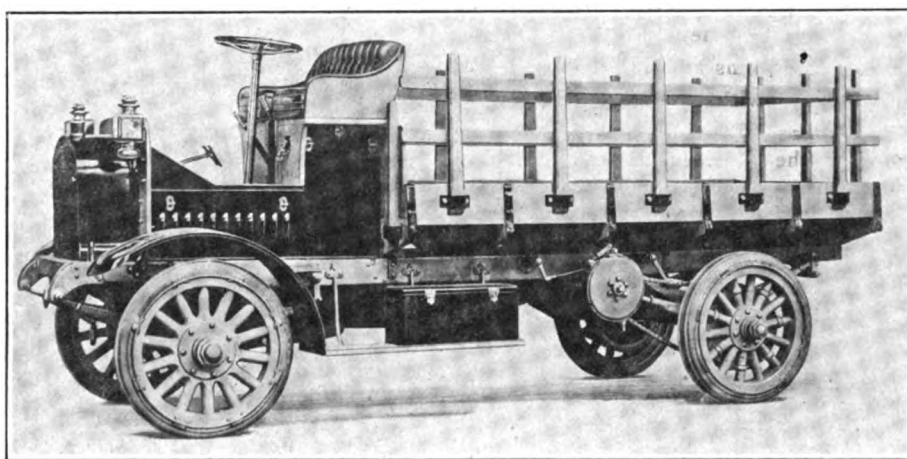
JEFFERY LAUNCHES LIGHT TRUCK

Veteran Manufacturer Holds Fast to Well-Tried Ideas in New Production—Center Control a Feature.

If there is anything in a name—and there is, old sayings to the contrary notwithstanding—the new Jeffery truck, the first vehicle of its kind to be placed on the market by the veteran Thomas B. Jeffery Co., of Kenosha, Wis., surely is not lacking in that aid to a good start. Behind it is the experience of many years devoted to the production of Rambler pleasure cars; and while pleasure cars are not trucks, it is un-

agency brake, which has the customary hand lever control, has two drums each $15\frac{1}{4}$ inches in diameter and 3 inches wide—a total braking surface of about 478 square inches. The service brake drums are located on the countershaft and the emergency brake drums on the rear wheels.

Pressed steel of channel form is used for the framing, the total overall length of which is 185 inches, with a length of 120 inches back of the driver's seat and available for carrying the body, which, of course, may be of any desired type or style. The stock body, however, is 60 inches wide and of the same length as the frame back of the seat—120 inches—and is of the platform variety, with low side boards carrying pockets into which the vertical posts



NEW JEFFERY $1\frac{1}{2}$ -TON TRUCK WITH HIGH STAKE BODY

questionable that the familiarity with the handling of materials, the knowledge of their limitations and the engineering experience gained in building thousands of passenger vehicles, must be of inestimable value in bringing out a light truck, such as the new Jeffery.

Built on sturdy, substantial lines, the Jeffery truck has a carrying capacity of 3,000 pounds, 60 per cent, of which is carried on the rear wheels. The motor, over which the footboard and seat are built, is of the four-cylinder vertical type, water-cooled, rated at 38 horsepower. Ignition is by Bosch high-tension magneto and lubrication by a combination of force feed and crankcase splash.

Transmission of power is through a system which includes a three-speed speed change gear, jackshaft, and final drive by side chains to the rear wheels. The maximum speeds on the first, second and third gears are $3\frac{1}{2}$, 7 and 15 miles per hour, respectively; control of speed changes is through a lever projecting through the center of the heelboard of the driver's seat, the steering wheel being placed on the left side.

The braking surface is very large for a light truck; the service brake, operated by a pedal, acts on two drums each $13\frac{1}{2}$ inches in diameter and $2\frac{1}{2}$ wide, while the emer-

gency brake is fitted. The body is heavily ironed. The height of the platform, when loaded, is 34 inches from the ground. All the springs are semi-elliptic. The wheelbase is 120 inches.

Both front and rear wheels are 34 inches in diameter; the front wheels are shod with 4-inch single tires and the rear wheels with 3-inch duals, all solids. The gasoline tank, placed under the seat, has a capacity of 20 gallons, and the lubricating oil supply is one gallon. The chassis is furnished with oil side and tail lights and the usual set of tools, the latter carried in a box secured to the frame on the left side of the car.

Meter Connections Should Be Watched.

The owner who would convert a car into a more up-to-date conveyance by altering its lighting system from acetylene or oil to electric would do well to remember that there is a right way and a wrong way to connect voltmeters and ammeters. Voltmeters always should be connected between the positive and negative poles of the battery or dynamo, or placed in a shunt. Ammeters, however, should never be shunted, or their comparatively delicate winding will be ruined by the heavy current. They should be connected in series on the line. Watch the pointer heads, as they sometimes are shaken off.

SPARKS ON FAN BLADE SUBJECT

Expert Tells of Experiments With Fans of Many Blades and Angles—His Conclusions and Advice.

"Whatever may be the opinion of others," said William Sparks, of the Sparks-Withington Co., Jackson, Mich., when the subject of the efficiency of cooling fans came up for discussion, "our tests have proven that it is not possible to obtain the efficiency from a two-bladed fan that can be obtained from one having four or six blades." The Sparks-Withington Co., it may be interpolated, is one of the largest producers of pressed steel fans and other metal products in the country, and inasmuch as it maintains an elaborate fan testing laboratory, with available data covering four years of experimenting, the experience of the company, as expressed by Sparks, cannot fail to carry weight.

"Our tests have been made on two-bladed fans," he continued, "and from that on up to 12 blades having various angles and widths ranging from 15 to 50 degrees angle and from one inch in width up to six inches. A two-bladed fan cannot be manufactured to deliver the same volume of air as a four or six-bladed fan does without increasing the diameter of the fan or its speed. When the speed is increased the amount of power consumed is increased proportionately, and consequently the efficiency drops below that which is obtainable with a properly designed four or six-bladed fan.

"From 13½ inches up to and including 18 inches, six blades set at an angle of 30 degrees are most efficient and economical; a two, three or four-bladed fan at the same speeds will give more air per blade, but does not give the total in volume. So far tests have demonstrated that it is not economical to increase the angle of the blades beyond 30 degrees. At 40 degrees blade angle the efficiency begins to drop and instead of getting a suction or exhaust from the fan we find the blades operate very much as does a paddle wheel, driving the air to the sides of the hood instead of drawing the air through the radiator and forcing it back over the top and sides of the motor.

"It is quite true that on some cars no fan at all is used, but according to unmistakable signs the tendency is for those manufacturers who heretofore have used no fans to equip their motors with them. Without doubt, motors can be cooled without fans, but in doing so it has been necessary so far to increase the size of the radiator to such an extent that the cost has been greater than the cost of the fan.

"As for fan cooling in winter time, a fan can no doubt be made with blades so that the angle can be altered as conditions re-

quire; its cost, however, would be materially greater than is the cost of the ordinary fan and few car owners would care to bother changing the angle of four or six blades every time the temperature changed. A simple way to overcome the difficulty is to slacken the belt and allow it to slip, which requires, in the majority of cases, merely the loosening of a single set screw and the lowering of the fan hub or socket.

"In regard to the possibility of fan blades becoming loosened and injuring persons by flying off, there really is little excuse for such occurrences these days. For several years there has been on the market a fan the blades of which are all one piece of metal, and the manufacturers of which guarantee it against such accidents."

The Anvil and the Inner Tube.

When, not long ago, a motor car pulled another car by means of a Kelly-Spring-



THE SHOW WINDOW TEST

field inner tube, the feat was considered a remarkable one, as indicative of the tensile strength of rubber tubing; but the Boss Rubber Co., of 1614 Broadway, Denver, Colo., recently furnished another ocular demonstration in its show window of what can be done with that brand of inner tube which must have caused passers-by to rub their eyes in astonishment. As will be seen from the accompanying illustration, an anvil weighing fully 150 pounds was suspended from two one-inch pieces of inner tubing, to which it remained attached for a period of eight days. Despite the heavy and continuous pull on the rubber, at the end of that time it was found that the two pieces had not been stretched materially by this unusually strenuous task, and returned almost to their normal length.

Facilitating Painting of Smooth Metal.

Where smooth metal is to be painted, the application of a very thin coat of raw linseed oil before the first color is applied will prevent chipping. The coating of oil should be given ample time to dry thoroughly before painting.

CONTRIBUTORY NEGLIGENCE AGAIN

Germany's Highest Court Delivers Opinion Affecting Common Form of Street Accident—Automobilist Absolved.

There is hardly any single item connected with automobile accidents which has been productive of so many conflicting decisions and definitions as that of "contributory negligence." A new and far-reaching decision of this sort just has been rendered by the Reichsgericht, the highest court of the German Empire, in the case of an accident claim filed by the parents of a 12-year-old girl against the owner of a motor car, which ran over and injured the girl in one of the busiest streets of Hamburg. According to the testimony of eye-witnesses and the girl herself, she ran across the street from the left to the right directly into the path of the motor car, which happened to be hidden from her view at the moment by a slow-moving furniture van.

The chief judge of the Reichsgericht in reversing the decision of the lower court, which was favorable to the girl, declared that it must be presumed that a 12-year-old girl born and reared in a busy metropolis like Hamburg possesses a sufficient realization of the dangers of modern street traffic to use particular care when crossing the street between intersections. That she could not see the motor car on account of the intervening furniture van did not in any way reduce her own "contributory negligence"; she should have assured herself of the freedom of the street from traffic at that moment, before venturing to run across.

Piston Rings as Cause of Power Loss.

Among the many causes of loss of power it is doubtful if there is any that is more obscure or more difficult to locate than that which results from loose piston rings—rings that have become so worn that they do not fit their respective grooves properly. The reason for the loss of power from such a cause is twofold: Due to the leak, the partial vacuum caused during the down stroke of the piston is reduced, which results in an insufficient quantity of mixture being drawn into the combustion space, and part of the explosive force is lost when the gases pass the rings. Generally the condition may be detected by running the engine for a short time and inspecting the crank case for smoke. Of course if the crank case is not provided with hand-holes or inspection plates such procedure is not possible and it will be necessary to rely on the hearing alone, the engine being cranked slowly by hand. The remedy is obvious and is embraced in a renewal of the piston rings. Sometimes a similar trouble may be traced to scored cylinders.

NO ESCAPE FOR MICHIGAN OWNERS

Supreme Court Upholds Constitutionality of Law Making Owners Liable for Use of Their Cars by Any Person.

Despite the fact that only two months ago the Michigan Court of Appeals held the owner blameless for damage caused by his chauffeur, who used his car notwithstanding orders to the contrary, the Supreme Court of that State just has upheld the law making owners responsible for injury "occasioned by the negligent operation by any person" of their automobiles. The decision, while fraught with consequences to Michigan motorists, is of general interest, and makes for mischief outside the State, in that it is likely to be quoted as a precedent in other cases. It was rendered in the suit of Johnson vs. Sergeant, which grew out of an accident caused by Sergeant's automobile while it was being driven by his son. The lower court decided in favor of the plaintiff, believing the law itself to be unconstitutional, from which decision Sergeant appealed and which appeal he lost.

This statute itself is a novelty in legislation, in that it completely changes the common law rule making one responsible only for the negligence of himself or of his servants while acting within the scope of their employment, and it practically makes every automobile owner an insurer against injury caused by his machine.

The statute is Act 318 of the Public Acts of 1909—according to its title: "An Act Providing for the Registration, Identification and Regulation of Motor Vehicles Operated Upon the Public Highways of This State, and of the Operators of Such Vehicles."

Subdivision 3 of Section 10 is as follows:

"The owner of a motor vehicle shall be liable for any injury occasioned by the negligent operation by any person of such motor vehicle, whether such negligence consists in violation of the provision of a statute of this State or in the failure to observe such ordinary care in such operation as the rules of the common law require; but such owner shall not be liable in case such motor vehicle shall have been stolen."

The validity of the statute was attacked on two main grounds: First, on the ground that the title of the act was not broad enough to include the particular section referred to; and, second, on the ground that the liability attempted to be created by that section was beyond the authority of the legislature to create, and, consequently, that the act was unconstitutional to this extent. It was also contended that even if the act was valid, no action could be brought under it against the owner of an automobile until liability for negligence had

first been legally established against the operator of the vehicle. The court decided squarely against the defendant on all these points, saying, among other things:

"The diligence of counsel has failed to call our attention to another similar statute. We also have consulted such textbooks upon the automobile as are in the State Law Library, and do not find a similar statute.

"It is well recognized that the automobile upon the highway in the hands of an incompetent or a reckless driver may result in great injury to persons or property. Because of this fact the State, in the exercise of its police power, may pass statutes in relation to the ownership of automobiles and the running thereof.

"Under the term 'regulate' very broad powers may be exercised. It means both government and restriction. The title to the act before us has the words: 'Regulation of Motor Vehicles Operated Upon the Public Highways of This State and the Operators of Such Vehicles.' This language certainly suggests to an automobile owner that the provisions of the act are likely to interest him. The Legislature has gone a long way in this statute in fixing the liability of the owner, even though he may not be in fault. We do not think, however, it can be said to have exceeded its authority under police power.

"It is said judgment ought to be obtained against the driver of the automobile before bringing action against the owner of the vehicle. No authority is cited upon this proposition. There is no suggestion of that kind in the statute itself, and no good reason has been suggested to us why it should have such a construction."

Judges at Odds Over California Law.

Although Judge Bledsoe, of the Superior Court of California, sitting at San Bernardino, recently declared that the new State automobile law is unconstitutional, because it makes it a felony for any person to drive an automobile while said person is under the influence of liquor, Judge H. Z. Austin, sitting in the Superior Court at Fresno, declared the law constitutional and added that the automobile must be considered a vehicle which is in a class by itself. "A horse," he declared, "has instinct to guide it, and street cars run on rails that keep them in a certain path, but an automobile depends entirely on the driver. If the driver is under the influence of drink the path of the car is apt to be zig-zagging from one side of the street to the other, to the imminent danger of the public using such street." He emphatically stated that according to his opinion such automobile legislation is not class legislation. The decision arose out of an accident in which Stanley James, of Fresno, while alleged to have been in a state of intoxication, ran over a man and injured him, and subsequently was indicted for felony.

EXTRA PROTECTION FOR CHAUFFEURS

German Government Prepares for Compulsory Insurance of Motor Car Drivers—Car Owners to Pay the Premiums.

In pursuance of its well-known "paternal" inclinations, the German government has taken a step which is of the utmost importance to all owners of motor vehicles, whether they reside in the Land of the Kaiser or are merely transient tourists. It has decreed the obligatory insurance of all drivers of automobiles by their employers, against accident and personal injury, regardless of whether or not the employers or drivers already are insured in any of the several liability insurance companies doing business in the empire. The order will go into effect on January 1, 1913.

During the protracted discussions in the Reichstag regarding the best means by which an adequate insurance premium for chauffeurs could be fixed upon—that is to say, a premium which would allow the new insurance bureau to be self-supporting, and which yet would not be oppressive upon the automobile owners—interesting disclosures were made regarding the percentage of accidents in which drivers of various vehicles suffered injuries. By means of voluminous statistics it was proven that the accident percentage among chauffeurs in both private and public service was considerably lower than that among drivers of horse-drawn vehicles, and that the accidents which occurred to automobiles rarely resulted in such serious injuries as those caused by bolting horses, or falling off the seat in front of the wheels—an accident which is one of the most frequent among slow-traveling ox-drawn or horse-drawn carts in the country districts where the driver usually falls asleep on his seat.

The term "chauffeur" or "motor car driver" in the sense of the new regulations includes all assistants, helpers, cleaners, washers, etc., employed in garages; helpers and errand boys which may be called upon to accompany the driver of a motor truck belonging to mercantile establishments, and also footmen or servants, called upon to accompany the regular chauffeur on touring trips or shopping trips, while the employer is in the tonneau of the car. A special paragraph in the new law makes allowance for the rapid advance of aerial navigation and specifically includes drivers or pilots of passenger carrying aeroplanes or dirigible balloons, among the "chauffeurs" to be subject to obligatory accident insurance.

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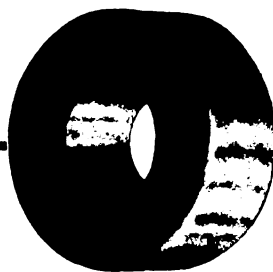
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999,843. Shock Absorber. Frederick Nielsen, Boston, Mass. Filed June 8, 1911. Serial No. 631,915.

1. A shock absorber comprising a casing having a closed chamber, co-operative relatively movable elements therein for acting upon a cushioning fluid, said elements dividing said chamber into two smaller chambers, two flow passages for conducting the cushioning fluid back and forth from one of said smaller chambers to the other, a spring-tensioned valve for normally closing one of said passages, said valve being adapted to be forced open by pressure of said cushioning fluid in either direction, and a weighted valve for controlling the flow in the other passage, said weighted valve having spring tension means for normally holding it open.

999,960. Resilient Wheel. Victor E. Clark, Grand Rapids, Mich. Filed Mar. 1, 1910. Serial No. 546,692.

1. A resilient wheel, comprising a hollow closed rim, a pneumatic tube in the rim, a ring surrounded by the rim, tubular spokes connecting the rim and ring, an angular hub movable within the ring, push rods slidable in the spokes and supporting the hub, segments on the outer ends of the rods engaging the tube, T-heads on the inner ends of the rods, and rollers between the respective T-heads and the respective faces of the hub.

1,000,069. Pneumatic Tire. Charles E. Brower, Memphis, Tenn. Filed Feb. 7, 1910. Serial No. 542,471.

1. A tire consisting of an outer casing, a plurality of inflatable units therein, each of which is provided with a controlling valve, an inflating tube common to the units and through which air is forced to enter the units, a deflating tube also common to the units and pressure operated devices within the deflating tube for effecting the opening movements of the valves.

1,000,128. Internal Combustion Engine. George F. Swain, Chicago, Ill. Filed Jan. 28, 1909. Serial No. 474,836.

1. In an internal combustion engine, the combination with two castings providing oppositely arranged engine cylinders having an interposed crank chamber, of oppositely arranged pistons reciprocating in said cylinders, the walls of each of said castings being provided with a longitudinal passage leading from the crank chamber and, at the end of the passage, with an inlet port to the cylinder adapted to be opened and closed by the piston, the walls of said castings being further provided with passages therein adapted, when the castings are assembled, to form a continuous fuel-supply passage communicating at its opposite ends with the crank chamber through openings arranged to be controlled by said pistons, each of said cylinders being further provided with an outlet port adapted to be opened and closed by the corresponding piston.

1,000,137. Wind Guard for Vehicles. Martin L. Williams, South Bend, Ind. Filed June 8, 1908. Serial No. 437,219.

1. In a windguard for vehicles, the combination with a stationary lower frame

member and a movable upper frame member, of links pivotally connecting said frame members, a spring actuated link pivotally connected to one of said frame members, a socketed member mounted on the outer side of the other frame member and adapted to receive said link for yieldably locking said upper member against movement, and a transversely extending member carried by said link for positively locking the upper member against movement in the direction permitted by said spring actuated link.

1,000,148. Speed Recorder. William H. Bristol, Waterbury, Conn. Filed Jan. 7, 1911. Serial No. 601,274.

1. A speed recorder comprising: a suitable casing, and a cover therefor; a chart support within said casing for a rotatable chart; a marking member passing through said cover and movable therewith; and means to move the same over said chart.

1,000,165. Vehicle Tire. John B. Fischer, Chicago, Ill. Filed Oct. 14, 1910. Serial No. 587,030.

1. A resilient vehicle tire comprising a case tube having its inner portion formed with rounded corrugations, and transverse spacing pieces located at the depression points of the corrugations and forming therewith rounded cavities spaced apart throughout the tire.

1,000,188. Automatic Lubricator for Motorcar Engines. Alfred B. Morse, South Easton, Mass. Filed Mar. 7, 1908. Serial No. 419,737.

1. In a lubricating system, the combination with a chamber containing the lubricant, of means for positively feeding the lubricant into and out from said chamber, with a differential in feeding capacity in favor of the outlet feed, the outlet conduit being located to maintain the lubricant at a predetermined level within the chamber.

1,000,199. Combination Turn-Table and Jack for Automobiles. Charles F. Sautter, Jamaica, N. Y.; Mary Teresa Sautter, Brooklyn, N. Y., administratrix of said Charles F. Sautter, deceased. Filed July 30, 1910. Serial No. 574,713.

1. A combination turn table and jack, comprising a toggle lever having rotatable rollers located at the lower portion of and near the ends of the lever, swivel connections between the lever and the rollers, the ends of said lever being adapted to engage the wheels of a vehicle and when the lever is operated to lift the vehicle, while the swivel connections allow the device to turn in a circular path.

1,000,232. Lubricator. William F. Broeker, Beardstown, Ill. Filed June 8, 1910. Serial No. 565,898.

In combination with a grease cup having its upper face provided with oppositely arranged depressions, of a piston mounted therein for vertical adjustment and including a stem rectangular in cross section extending upwardly from a piston, a closure fitted down over the stem in engagement with the upper surface of the cup and provided with a peripheral flange and including oppositely arranged lugs pressed out of the flange to engage the depressions of the cup, a pin extending transversely of the stem adjacent to its upper end, a washer on the stem below the pin, and a spring interposed between the closure and the washer to hold the lugs and depressions in co-operation thereby preventing rotary movement of the closure, the spring having its lower portion arranged within the periph-

eral flange to prevent displacement of the spring.

1,000,259. Automobile Radiator. Herman Hager, Detroit, Mich. Filed Nov. 7, 1910. Serial No. 591,139.

1. In an apparatus of the class described, a plurality of relatively broad, flat, vertically arranged, horizontal tubes spaced apart for the passage of air between them, suitable headers or chambers with which said tubes communicate, baffle plates supported in said headers to insure a circulation of water through each of said tubes, and means adapted to connect with the circulating pipes leading to and from the engine.

1,000,264. Graduated Shock Absorber. Edward V. Hartford, New York, N. Y. Filed Aug. 15, 1905. Serial No. 274,267.

1. An anti-vibration device, comprising a plurality of friction members, means for adjusting the friction between said members, means for connecting the said members to the running gear and body portion of a vehicle, respectively, the said members having a minimum frictional contact when they are in their normal position, and being so arranged that the friction is gradually increased as they are moved from said normal position in either direction, substantially as described.

1,000,275. Taximeter. John G. MacPherson, Philadelphia, Pa., assignor, by direct and mesne assignments, to The MacPherson Company, Incorporated, a Corporation of Delaware. Filed Jan. 27, 1910. Serial No. 540,446.

1. In a taximeter, the combination with a clock, and indicating mechanism, of mechanism controlled through the medium of the clock for operating the indicating mechanism, and means for operably connecting the same with the minute hand arbor of the clock.

1,000,307. Reed for Motor Horns and the Like. Etienne Teste, Paris, France. Filed Dec. 28, 1908. Serial No. 469,579.

1. The combination with an internally threaded sleeve having internal shoulders, of a reed formed of a shell and tongue and extending into the sleeve, means in the sleeve for holding the shell and tongue in position in the sleeve, and an apertured and exteriorly screw threaded plug screwing into the sleeve for clamping the shell and tongue in said sleeve.

1,000,322. Vehicle Wheel. Silenus D. Brooks, Oneonta, N. Y., assignor to Charles N. Murdock, Oneonta, N. Y. Filed Feb. 4, 1910. Serial No. 542,154.

1. In a vehicle wheel, a hub, a plurality of spokes mounted in the hub, a tubular member mounted on the outer end of each of said spokes, a rim, a plurality of socket members secured to said rim and telescopically fitting over said tubular members and said spokes, a spring for each of said spokes, a spring for each of said spokes surrounded by said tubular member and said sockets and adapted to press against the bottom of said sockets and the ends of said spokes, the outer rim normally spaced from said first mentioned rim, a plurality of spaced springs arranged between said rims, and bolts for holding said rims against independent rotary movement, said bolts extending through said springs for holding the same in proper place.

1,001,600. Internal Combustion Engine. William E. Adams, Salem, Mass. Filed June 24, 1909. Serial No. 503,991.



INDEX TO ADVERTISERS



A		H		O	
Abbott Motor Co.	1078	Hartford Auto Parts Co.	1070	Oakland Motor Car Co.	1077
Ajax-Grieb Rubber Co.	1069	Hartford Suspension Co.	1023	Owen, R. M., & Co.	1015
American Ball Bearing Co.	1012	Havers Motor Car Co.	1076	P	
American Motors Co.	1076	Haynes Automobile Co.	1077	Packard Electric Co.	1073
American Starter & Carburetor Mfg. Co.	1073	Haywood Tire & Equipment Co.	1025	Parish Mfg. Co.	1062
Anderson Suark Plug Co.	1063	Henderson Motor Sales Co.	1078	Penn Spring Works	1063
Apple Electric Co.	1063	Hot-Spark Plug Co.	1074	Perfection Spring Co.	1063
Argo Electric Vehicle Co.	1075	Hupp Motor Car Co.	1064	Petrel Motor Car Co.	1075
Automobile Supply Mfg. Co.	1064	Hyatt Roller Bearing Co.	1080	Pittsfield Spark Coil Co.	1022
B		Hydraulic Pressed Steel Co.	1062	Pullman Motor Car Co.	1075
Badger Brass Mfg. Co.	1072	I		Q	
Baldwin Chain & Mfg. Co.	1068	Inner Shoe Tire Co.	1063	Queen Mfg. Co.	1072
Barthel, Daly & Miller	1080	International Accessories Corp.	1026	Quimby, J. M., & Co.	1064
Bartholomew Co.	1076	Inter-State Automobile Co.	1078	R	
Benz Auto Import Co.	Inside F. C.	Invincible Starter Co.	1075	Rajah Auto Supply Co.	1073
Bosch Magneto Co.	1069	J		R. C. H. Corp.	1064
Bossert Co.	1074	Jamestown Wheel & Mfg. Co.	1062	Reflex Inspection Light Sales Co.	1006
Bower Roller Bearing Co.	1074	Jeffery-DeWitt Co.	1013	Regal Motor Car Co.	1019
Bretz, J. S., Co.	1064	Johns-Mauville Co., H. W.	1070	Remy Electric Co.	1070
Briggs-Detroit Co.	1075	K		Royal Equipment Co.	1074
Brown Co.	1064	Kellom, Chas. F., & Co.	1064	S	
Brown-Lipe Gear Chapin Co.	1073	Kelly-Springfield Tire Co.	1062	Sackman Mfg. Co.	1070
Bush Mfg. Co.	1068	Kinsey Mfg. Co.	1066	Safety Tire Gauge Co.	1063
C		Kinsler-Bennett Co.	1072	Salisbury Wheel & Mfg. Co.	1080
Cartercar Co.	1077	Kissel Motor Car Co.	1014	Schrader's Son, A., Inc.	1065
Century Electric Car Co.	1074	Kline Motor Car Corp.	1080	Selden Motor Vehicle Co.	1075
Champion Ignition Co.	1071	Knox Automobile Co.	1075	Shawmut Tire Co.	1072
Champion Spark Plug Co.	1070	L		Smith, A. O., & Co.	1073
Clark-Carter Automobile Co.	1076	Lauth-Juergens Motor Car Co.	1066	Sparks-Withington Co.	1071
Classified Advertising	1061	Leather Tire Goods Co.	1079	Speedwell Motor Car Co.	1077
Colby Motor Car Co.	1078	Locomobile Company	1064	Splitdorf, C. F.	1069
Colonial Electric Car Co.	1078	Lovell-McConnell Mfg. Co.	Inside B. C.	Springfield Metal Body Co.	1063
Consolidated Mfg. Co.	1024	M		Standard Roller Bearing Co.	1064
Continental Motor Mfg. Co.	1063	McGraw Tire & Rubber Co.	1062	Standard Oil Co.	1071
Covert Motor Vehicle Co.	1075	McIntyre, W. H., Co.	1070	Standard Tire Protector Co.	1063
Cramp, Wm. & Sons, Ship & Engine Building Co.	1073	Marion Sales Co.	1078	Stearns, F. B., Co.	1077
D		Mayo Radiator Co.	1007	Stewart & Clark Mfg. Co.	1020
Dayton Rubber Mfg. Co.	1063	Metz Co.	1078	T	
Dean Electric Co.	1017	Michelin Tire Co.	1072	Thomas, E. R., Motor Car Co.	1063
Diamond Chain & Mfg. Co.	1065	Michigan Buggy Co.	1078	Timken Roller Bearing Co.	1011
Diamond Rubber Co.	1027	Miller, Chas. E.	1007	U	
E		Moline Auto Co.	1068	United Rim Co.	1073
Electric Welding Products Co.	1026	Mosler, A. R., & Co.	1062	U. S. Auto Horn Co.	1074
Empire Tire Co.	1076	Moss Photo Engraving Co.	1067	U. S. Motors Co.	F. C.
F		Motor Car Equipment Co.	1062	United States Tire Co.	1062
Faries Mfg. Co.	1074	Motor Truck Body Co.	1016	V	
Federal Rubber Mfg. Co.	1008	Mott Wheel Works	1080	Velie Motor Vehicle Co.	1075
Fedders Mfg. Works	1076	Motz Tire & Rubber Co.	1062	W	
F. I. A. T.	1072	N		Warner Gear Co.	1073
Firestone Tire & Rubber Co.	1005	National-Acme Mfg. Co.	1027	Warner Instrument Co.	1069
Fisk Rubber Co.	1021	National Motor Vehicle Co.	1077	Weed Chain Tire Grip Co.	1063
Ford Motor Co.	1010	New Departure Mfg. Co.	1060b	Western Motor Co.	1072
G		New Process Rawhide Co.	1070	Wetherill Finished Castings Co.	1080
Gray & Davis	1018	New Tyr Mfg. Co.	1068	Whitney Mfg. Co.	1022
Goodyear Tire & Rubber Co., The	1090d	Nordyke & Marmon	1077	Willard Storage Battery Co.	1062
Grossman, Emil, Co.	1009	Not-A-Crank Gas Engine Starter Co.	1074	Willys-Garford Sales Co.	B. C.
				Willys-Overland Co., The	1028
				Winton Motor Car Co.	1077

1. A combined internal combustion motor and air compressor having, in combination, an explosion chamber, a gas compression chamber, means for affording communication between said chambers an air compression chamber located between said chambers and entirely closed therefrom, and pistons operating in all of said chambers, substantially as described.

1,001,663. Vehicle. Tire. Arthur H. Marks, Akron, Ohio. Filed Mar. 26, 1906. Serial No. 307,969.

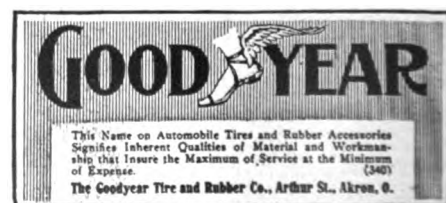
The combination of a wheel rim, outwardly extended flanges at the sides thereof, and a plurality of rubber tires fitted up-

on said rim, with a split ring removably fitted upon said rim and lying between and in engagement with the approximate edges of the base portions of said tires; the side faces of said ring conforming in shape to the side faces of the tire bases with which said ring engages and fastening devices engaging upon both edges of each tire to hold said tires upon the rim, and means for contracting said ring in diameter while upon said rim.

1,001,635. Tire Grip. Leonard B. Gaylor, Stamford, Conn. Filed Mar. 3, 1911. Serial No. 611,976.

1. In a tire grip, continuous rigid annu-

lar means for the support of the grip irons, and grip irons made of metal having greater width than thickness rigidly connected to said supporting means and bent flatwise to inclose the periphery of the tire.



THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXX
No. 12

New York, March 14, 1912

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Two dollars a year

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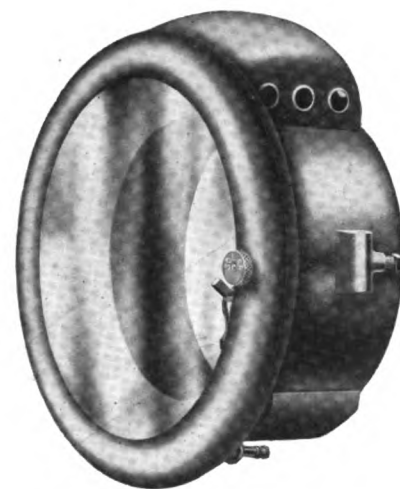
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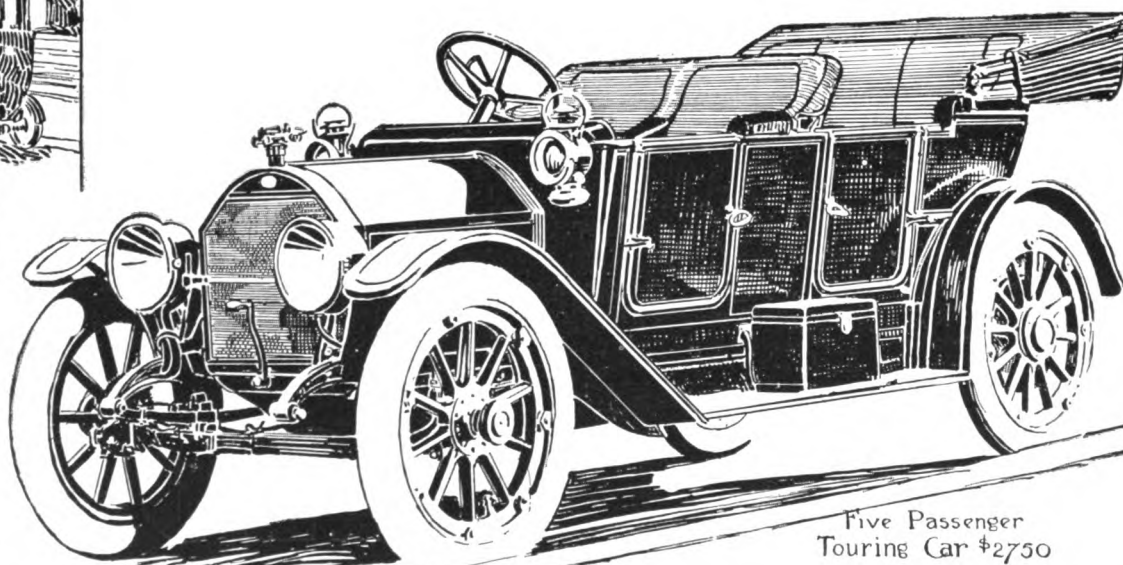
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Five Passenger
Touring Car \$2750

THE MOTOR WORLD

Vol. XXX

New York, U. S. A., Thursday, March 14, 1912.

No. 12

DESHAUM PROJECTS MOTOR COLONY

Enthusiastic Detroit Obtains Option on Large Tract and Sees Glowing Prospects—Has a Car Ready.

W. Andrew DeShaum, of Detroit, who declares that he built an automobile as long ago as 1895 and competed in the first race run in this country and claims to be the inventor of the spark plug, has undertaken the promotion of an automobile enterprise which has caused even Detroit to rub its eyes.

Several months ago he organized and incorporated the Suburban Motor Car Co., which \$500,000 in capital stock, of which he states \$187,000 has been paid in actual cash; he also has designed a car, which he styles the Suburban Limited, and around the car and the company he has sketched plans for not only a model automobile factory but for a model village which is to be located in Ecorse, Mich., which is next door to Detroit, and where DeShaum and his associates have secured options on 214 acres of land, upon which they propose to carry out their plans. They have made a cash payment on the property and expect to place a mortgage on it for the balance, and already, it is stated, the city dads of Ecorse have agreed to change the name of the town to Suburban City, to harmonize with the name of the car which DeShaum expects to produce there.

DeShaum, who is vice-president and general manager and engineer of the company, is nothing if not enthusiastic. Before going to Detroit he was located in Buffalo, where he undertook to form the DeShaum Motor Syndicate. It failed to come to a head, but later he did organize the DeShaum-Hornell Motor Co., in Hornell, N. Y., whose plant, however, never was completed. He has engaged in other ventures since, but none so wonderful as the Ecorse project which now is so near his heart. He already has had a picture drawn of the factory he hopes to erect in Ecorse

—which will employ a matter of 5,000 men—and of the model village which he hopes to lay out. This includes parks, playgrounds, athletic fields and 150 or 1,000 workmen's homes, the sale of which, DeShaum believes, and the incidental rise of real estate, will place the Suburban Motor Car Co. in a position where, even if it never builds a car, it will guarantee all stockholders against loss and leave a cash surplus in the treasury.

The men who are associated with him are William Lankin, a hardware and automobile dealer in Bad Axe, Mich., who is president of the Suburban company; Dr. O. B. Bachman, of Flint, Mich., who is secretary, and Frank H. Farnham, of Fenton, Mich., who is treasurer.

If everything goes as DeShaum hopes it will go, he expects to be doing business of some sort and smoking his favorite brand of cigarette in Ecorse by May 1st next.

Carburettor Contract Leads to Court.

Suit for \$4,463.40 has been instituted in the Wayne County Circuit Court, in Detroit, by the Holley Bros. Co. against the Regal Motor Car Co., both of Detroit, for alleged breach of contract, the suit growing out of a contract executed June 23, 1910, for 1,500 Holley carburettors, at \$5.50 each, and two succeeding orders for, respectively, 100 and 650 carburettors. The Holley Bros. Co. alleges that after a portion of the carburettors had been delivered and paid for the contract was canceled, leaving on its hands a large quantity of material and parts which had been purchased because of the order. The amount sued for represents the value of these parts and the loss of labor and profits.

Overland to Establish Foreign Office.

Claude A. George, assistant sales manager for the Willys-Overland Co., and one of the veterans in the Overland service, is booked to sail from New York on the Luisitania on the 20th inst. He first will visit England and then will go to Hamburg, Germany, where he will locate permanently as the foreign representative of the Willys-Overland interests.

OFFICERS CUT SALARIES IN HALF

But Even That Heroic Treatment Failed to Save Wyckoff, Church & Partridge—Friendly Creditors Take Action.

Embarrassed by an abundance of orders, heavy overhead expenses and a lack of sufficient working capital to permit a quick turn-over, Wyckoff, Church & Partridge, Inc., of New York, on Tuesday last, 12th inst, were placed in the hands of a receiver at the instance of three friendly creditors. John S. Shephard, Jr., was named as receiver by the United States Court, and was authorized to continue the business twenty days. The three creditors who filed the petition in bankruptcy were the Class Journal Co., \$4,000; Federal Printing Co., \$1,500, and Henry W. Johns, \$15,000. Johns was treasurer of the company and his claim represents money loaned.

During the past three months rumors have been afloat that all was not well with Wyckoff, Church & Partridge, the rumors apparently being borne out by its failure to promptly meet obligations. This state of affairs led to threats on the part of certain creditors, and the receivership proceedings were instituted to prevent unfriendly action on their part.

The liabilities of the company are \$700,000, and the assets in excess of \$500,000. The liabilities are for money loaned, merchandise, rent and other obligations; the assets consist of a factory at Kingston, N. Y.; equity and leasehold, outstanding accounts and material on hand.

Wyckoff, Church & Partridge, Inc., which occupies the almost palatial building at Broadway and 54th street, is the outgrowth of the Standard Automobile Co., which was started in May, 1903. Imported cars then were handled, and subsequently the name was changed to the Decauville Automobile Co., after the foreign car of that name, and the capital stock increased to \$500,000. In 1906 the firm of Wyckoff, Church & Partridge took over the business and gradually

thereafter foreign cars went into an eclipse, and the Stearns agency having been secured that American car was pushed to the fore until it was the firm's chief asset. In September, 1909, the capital was increased to \$1,000,000, and about that time the Wyckoff, Church & Partridge principals became interested in the W. A. Wood Automobile Co., of Kingston, N. Y., which had acquired the plant of the ill-fated Allen-Kingston Company.

The Wood company set out to manufacture trucks, but it was slow in getting started—so slow, in fact, that Wyckoff, Church & Partridge themselves secured the American rights for the Commer truck. First these trucks were imported and later the Wood company undertook to reproduce them, the actual production but lately having attained real proportions.

The relations between the Wood company and Wyckoff, Church & Partridge were so very close that last year the latter became a corporation and almost immediately absorbed the Wood Company. Shortly before that time the agency for the Stearns had been relinquished and Wyckoff, Church & Partridge, Inc., let it be known that the factory in Kingston would produce not only trucks but touring cars, the latter to be styled the Guy Vaughn car, the first few of which have just made their appearance.

In addition to the sale of automobiles and, later, their manufacture, Wyckoff, Church & Partridge dipped deeply into the accessory business, maintaining a separate establishment for their marketing.

These several irons which were in the fire and the heavy overhead and other expenses which they entailed finally brought about such a situation in January last that the officials are said to have applied heroic treatment and reduced their own salaries 50 per cent. One of the officers also is said to have loaned the corporation \$100,000. This self-sacrifice, however, served no purpose, and the receivership resulted. The reputation of the house and its products, however, is such that it is believed it will be able to weather the storm and that a way will be found to continue the business.

The officers of the corporation are Clarence F. Wyckoff, president; Ernest S. Partridge, vice-president, and H. W. Johns, treasurer. Besides the capital stock of \$1,000,000, there is outstanding \$200,000 in bonds.

Cortland Wagon Discloses Its Debts.

Schedules of the Cortland Motor Wagon Co., which removed from Cortland, N. Y., to Pittsfield, Mass., last year and "went broke" soon after, show liabilities of \$29,636.83, of which \$10,815.63 are in secured claims, \$11,519.20 unsecured, and \$7,267 on notes and bills which "ought to be paid by other parties." The assets are placed at \$13,798.33, of which \$12,651.10 is stock in trade. The company was petitioned into bankruptcy January 22.

EVER-READY FILES LONG ANSWER

Cites Numerous Alleged Anticipations of Klaxon Patent and Charges Horns Were Tampered With.

Containing not only the not uncommon allegation that the patents involved are void because of anticipation, but characterized by several unusual charges and reflecting embitterment that is but thinly disguised, the answer of the American Ever-Ready Co. to the suit brought against it by the Lovell-McConnell Mfg. Co., of Newark, N. J., indicates that the litigation between the two warring parties has reached an acute stage.

The Ever-Ready answer, which was filed last week in the United States District Court for the Southern District of New York, is a voluminous document, signed by Conrad Hubert, president of the Ever-Ready company, and includes affidavits made by Preston E. Gilling, the inventor of the Ever-Ready electric horn; Henry D. Williams, patent attorney of the defendant company; A. B. Norwalk, of the 35 Per Cent. Automobile Co.; Charles Gomprecht, Harry Weinstein and Abraham Holzman, all of whom are shining lights in the cut-price fraternity in New York.

The Lovell-McConnell complaint, of course, charges infringement of the five patents covering the Klaxon horn, Nos. 923,048, 923,049, 923,122, 957,161 and 968,898, which patents the Ever-Ready company alleges are void because of anticipation. In support of this contention, 43 United States patents and more than a dozen foreign patents are cited. These alleged anticipations date as far back as patent No. 219,374, issued September 9, 1879, to E. R. Whitney, of Montreal, which patent covers a foghorn, and include patent No. 779,033, issued January 3, 1905, to C. J. Eickhorn, of Newark, N. J., and which applies to improvements in an amplifying horn.

As a further defense, the Ever-Ready company claims that its electric horn is still in the experimental stage of manufacture, and that, although a few samples have been made and exhibited, its manufacture on a commercial basis has not been undertaken. They charge that the horn was exhibited to a representative of the Lovell-McConnell Mfg. Co. in November, 1911, when he called at the Ever-Ready office and asked to see it, and that undue haste was made in instituting the suit in order to prevent the exhibition of the horn at the automobile shows. In due course the horn was delivered to the attorney for the Klaxon people, and, according to the affidavit of Preston E. Gilling, the two rival horns exhibited by the Klaxon attorney in the Federal court in support of the charge of infringement had been tampered with in a manner to make them more closely re-

semble each other in appearance and in tone.

Henry's Omaha Company Incorporated.

The Omaha Motor Car Co., of Omaha, Neb., which was organized by Dave W. Henry, who assisted in the organization of the Inter-State and Colby companies, and who previously was connected with the Columbia interests, has filed articles of incorporation. It is capitalized at \$1,000,000, equally divided into common and preferred. Offices have been established in the City National Bank in Omaha, and meanwhile negotiations are progressing for a factory site, 400x125 feet. Temporary manufacturing facilities, however, have been arranged for, and it is expected that the new company's first car, a 30-horsepower under-slung model, listing at \$1,250, will be ready about May 1st.

Washington Tradesmen Form Association.

The Automobile Trade Association, of Washington, which has been in process of formation in the capital during the last month, completed its organization last week, when the following officers were elected: E. M. Van Ness, president; Norman S. Bowles, vice-president; E. W. Pazel, secretary; J. A. Thom, treasurer. They will serve only until June 30th, when it is expected the membership will be greatly enlarged and when another election will be held.

Rumors Cause Rubber Shares to Rise.

The shares of the Diamond Rubber Co., which have been showing remarkable strength during the last few months, jumped 12 points last week on the unlisted market in Chicago, and are now held at 297. Most of the other rubber companies' shares likewise are strong in the Chicago market, which has heard reports that a merger of several of the tire companies is impending, the name of the B. F. Goodrich Co. being specifically coupled with the rumors.

Exports of Engines Still Going Up.

Exports of automobile engines acquired still greater importance during January, 1912, there being no less than 837 gasoline automobile motors exported in that month, representing a value of \$102,028. For the seven months ending January the figures show 2,531 motors shipped abroad, valued at \$306,837—the sales of January alone, therefore, amounting to one-third of the total for the seven months.

Smart Tires Coming from Indianapolis.

The Smart Mfg. Co., which just has been incorporated with \$10,000 capital, has in view the manufacture of a new type of puncture-proof pneumatic tire originated by Barney Smart of Indianapolis. Plans are so well advanced that factory facilities in that city have been obtained at 336 West Vermont street, where the necessary machinery is being installed.

DAIMLER SUIT BRINGS WARM RETORT

Mercedes Repair Co. Says German Company Was Long Aware of Its Existence—Also Supplied Repair Parts.

"You're another!" is in substance the reply which the Mercedes Repair Co., of New York City, has made to the suit brought against it by the Daimler Motoren Gesellschaft, of Untertuerkheim, Germany, in which the right of the Repair company to use the name Mercedes is challenged. While the Daimler company, as told in the Motor World of January 25th, charges the defendant with appropriation of the name Mercedes without the plaintiff's knowledge or consent and with "palming off spurious, non-genuine motor parts as Mercedes parts," the Mercedes Repair Co., in its answer to the complaint, claims that not only was the Daimler company well aware of the use of the name Mercedes by the defendant company, but that there existed a tacit understanding between the two concerns, according to which customers of the Daimler company who desired to have their cars repaired were sent to the Mercedes Repair Co.

In support of this assertion, the defendant company claims that during the five years 1906-1911 it purchased at least \$100,000 worth of parts direct from the Daimler Import Co., and that in the correspondence relating to the purchase of these parts there was no mention made of the alleged objectionable use of the name Mercedes. Therefore, the defendant company believes that the Daimler company, by its sale of goods and sending of customers to the Mercedes Repair Co., tacitly recognized the right of the Mercedes Repair Co. to the trade name Mercedes.

As is customary in suits of this kind, the plaintiff has filed a petition to the court asking that the defendant be compelled to furnish a bill of particulars in support of its allegations, giving in detail its claims as to the sale of parts and sending over of customers.

Refinancing to Make Dorian Rim Secure.

Despite the personal embarrassment of Moritz and Max Rosett, the New York bankers who served as president and vice-president, respectively, of the Dorian Remountable Rim Co., it is now not at all likely that the company will be enmeshed in the Rosett troubles. Prompt action was taken to avert that possibility, the refinancing of the Dorian company being practically assured. In denying the report let fall in Rosett circles that a voluntary receivership for the Dorian Remountable Rim Co. might become necessary, both Attorney Keating and General Manager Keller, of the Rim company, state that the volume of orders in hand and the great increase in its

business during the past year is such as to make a step of the sort unnecessary and wholly improbable, and to enable the company to stand on its own feet, regardless of the Rosetts' difficulties.

Goodyear to Build Branch in Detroit.

Fire having routed it out of 251 Jefferson avenue, in which its Detroit branch was housed, the Goodyear Tire and Rubber Co. will erect a building of its own in that city. For the purpose, it already has purchased a site at the southeast corner of Antoine and Jefferson avenues, on which will be up-reared a five-story fireproof structure, 50x100 feet. Pending its construction, the Goodyear business is being transacted at what was known as the Goodyear Branch No. 2, which is located at 846 Woodward avenue.

Smalley Daniels to Move to Detroit.

Smalley Daniels, who for several years has acted as manufacturers' representative in Boston, has decided to remove his headquarters to Detroit, where he will be nearer to the factories with which he is associated. His removal, however, will not occur for several months, and when he does go, he still will continue his Boston establishment as a branch.

Londoners Drop French Car for American.

Charles Jarrott & Letts, Ltd., of London, England, have secured the British agency for Paige-Detroit cars, the transaction being effected during the recent visit of Mr Letts to this country. In addition to English cars, the London firm also handles the Chalmers and two French cars, one of which will be given up to make room for the Paige-Detroit.

Timken's Engineering Chief Goes Abroad.

H. W. Alden, chief engineer for the Timken-Detroit Axle Co., sailed for Europe last week. He went straight to Liverpool, from which point he will tour England and the Continent, visiting the leading automobile and parts factories with a view of obtaining first-hand information regarding foreign practices and conditions.

Studebaker Annual Meeting Next Month.

At the annual meeting of the Studebaker Corporation, which will be held April 2, in addition to routine business, the stockholders will be asked to ratify a contract made February 6, 1912, which adjusts certain differences arising out of the inventory made when the subsidiaries were acquired by the parent company.

May Make British Radiators in Detroit.

Lamplough & Son, Ltd., of London, manufacturers of radiators, are said to contemplate the establishment of an American factory in Detroit. Johann Bodeman, a representative of the firm, is now in the Michigan city and is reported to be seeking a site.

COURT UPHOLDS WEED'S CONTENTION

In Granting Preliminary Injunction, Judge Gives Wide Scope to Chain Tire Grip—Rules Against Limitations.

When, on the 6th inst., Judge Lacombe sitting in the United States District Court for the Southern District of New York, granted the preliminary injunction restraining the Atlas Chain Co., of Brooklyn, N. Y., from infringing the Parsons patent, covering the Weed Chain Tire Grip Co.'s product, as was briefly reported in last week's Motor World, he handed down a decision that has an important bearing on the Weed company's claim that the Parsons patent controls all forms of chain grips and not merely the "creeping" types, as the decision of another court seemed to say.

Both sides were well represented by counsel, and the case was fully presented, and almost as thoroughly as if it were on final hearing upon full proofs. The Atlas attorneys contended that a close fitting grip that did not hang loose on the tire and did not move around the tire with considerable rapidity was not within the Parsons patent, while the Weed people maintained that the Parsons invention lay in the structure itself and not in any method of application, degree of looseness or rate of travel, which view Judge Lacombe sustained in the following language:

"Ever since my attention was first called to the opinion of Judge Sanborn in the Excelsior case, the study given to this patent and to the others constituting the prior art convinced me that it was a highly meritorious one; that the concept of a moving or creeping chain ladder was something distinctly new and extremely useful; and that any chain grip of substantially the same type which does in fact creep when in use, whether slowly or rapidly, would infringe such patent. The great weight of judicial authority seems in accord with these views.

"It was quite a surprise to learn that the Court of Appeals in the Seventh Circuit had reversed Judge Sanborn. Reading their opinion it seems to me that they had given too much effect to the earlier patent on which they relied and eventually they reached the same conclusion, finding the patent, upon reargument, to be valid and infringed.

"It is contended here that the second opinion of that court holds that infringement of the Parsons patent cannot be found unless the device of defendant, not only creeps when in use, but is also applied with such great looseness that the cross chains are a part of the ground and not a part of the wheel, at the instant they are in action. I doubt whether the Court of Appeals meant to impose this limitation, but if they did, I prefer to range myself

with the other judges who have given the patent a construction broad enough to secure the improvement which the inventor discloses.

"This testimony shows that the chain grip of defendant in this suit does creep when it is in action running on the roadbed. It creeps very slowly when all the devices employed to tighten it on the wheel are applied with all the strength the user can apply; more rapidly when he does not take the trouble to exert himself. Moreover there is no particular reason why he should exert himself, the grip is quite as efficient whether it creeps fast or slow. There is no real controversy as to these propositions and it seems unnecessary to enquire whether centrifugal force does or does not operate to loosen its hold on the tire.

"The motion for injunction is granted."

Changes Among Prominent Tradesmen.

George H. Brown has been appointed sales manager of the Century Electric Motor Car Co., of Detroit. Previously he was a member of the Hupp-Yeats staff.

Alden H. MacMurtry, who has been a member of the Gray & Davis staff of electrical experts, has resigned that connection. He has become consulting engineer of the Aristos Co.

To fill the vacancy caused by the resignation of D. L. Whitford, H. D. Ryus has been appointed manager of the Oldsmobile branch in Los Angeles. Ryus is one of the veterans of Pacific Coast trade.

C. S. Mason has been promoted to the post of advertising and publicity manager for the Midland Motor Co., Moline, Ill. Heretofore, and for several years, he was cashier in the Midland establishment.

Charles A. Trask, who has been superintendent of the Cartercar Co., of Pontiac, Mich., since its organization, has resigned that office. It is stated that a choice of several similar positions has been offered him by other companies.

Gleeson Murphy has been elected vice-president of the General Motors Truck Co. He is also assistant to the president of the General Motors Co., an office he will retain, which means that his headquarters will continue to be in Detroit.

Otis H. Adams, of Dayton, Ohio, has given up the agency business bearing his name and joined the advertising staff of the General Motors Co. in Detroit. He will give his attention to the Elmore Mfg. Co., one of the General Motors group.

C. W. Fox has been made general manager of the Hupp-Yeats electric car department of the R. C. H. Corporation in Detroit. Fox, who is a member of the firm of Fox Bros. & Co., body builders, will retain his interest in that firm and devote a part of his time to it.

Harry J. Kearns, who for the past two and a half years has been connected with the advertising department of the Maxwell-

Briscoe Motor Co., has resigned that connection to become advertising manager for the Ajaz-Grieb Rubber Co. He succeeds D. H. Wetzel, who has gone with the Maple Products Co., of Utica, N. Y.

P. E. Kempton, who for some time has been assistant manager of the C. F. Splitdorf branch in San Francisco, has been promoted to the actual management of the establishment. His elevation was made possible by the transfer of E. A. Kelley, who has taken charge of the newer Splitdorf branch in Kansas City.

Edward F. Harris has been appointed assistant sales manager for the Henderson Motor Sales Co., distributors of Cole cars. Previously he occupied a similar position with the Parry Mfg. Co., of Indianapolis, of which R. P. Henderson then was sales manager. In the Henderson company he will be directly associated with his old chief.

W. H. Cameron, who for some three years has been chief engineer for the Willys-Overland Co., Toledo, Ohio, has resigned that office. He states that he has formulated no plans for the future, but intends to remain in Toledo for the present and take a much-needed rest. Fred I. Tone, formerly designing engineer at the Marion plant, which is a Willys property, has succeeded him.

Valveless Tube Litigation is Settled.

On Friday, March 8th, papers were filed in the United States District Court for the Southern District of New York, recording the court's consent to a settlement of the differences between the Valveless Inner Tube Co. and the Sealomatics Parent Syndicate of London, England, regarding the transfer of patent rights to the manufacture of inner tubes. As told in the Motor World of February 22, the Sealomatics syndicate sold certain patent rights to the Valveless Inner Tube Co., but failed to include a description of the secret processes involved in the manufacture of the tubes. In the meantime the Walpole Rubber Co. acquired the controlling interest in the Valveless company and prepared to manufacture the tubes. The disputes arising from their inability to accomplish this without the secret processes led to law, and so surprising and sudden was the publicity thrown upon the quarrel that the combatants hastened to settle the matter out of court. The terms of the settlement provide for the turning over of the secret processes to the Walpole Rubber Co., which hereafter will be able to turn out the "valveless" tubes according to the Sealomatics patents.

Van Sicklen Again Heads Chicago Dealers

For the third time N. H. Van Sicklen was elected president of the Chicago Automobile Trade Association at its annual meeting which occurred Monday last, 11th inst. The other officers chosen, all of whom, like Van Sicklen, were unanimously

elected, are as follows: Charles M. Hayes, vice-president; H. Paulman, treasurer; H. N. Fowler, secretary. C. M. Garrett, F. A. Groves and L. E. Burr, directors for one year; A. E. Moore and H. C. Tillotson, directors for two years. During the past year the growth of the organization has been remarkable. Its membership has increased from 58 to 130, and it now has a cash balance of \$5,000, as against \$378 a year ago. It now has in contemplation the establishment of credit and employment bureaus under the direction of a paid manager.

Allen Again Attacks Niagra Cover.

Alleging that the tire cover used by the Niagra Auto Cover Co., of New York City, is an infringement of patent No. 799,662, issued to Benjamin Nathan on September 19, 1905, the Allen Auto Specialty Co. on Thursday last, 29th ult., again filed suit in the United States District Court for the Southern District of New York, asking for an injunction, accounting, damages and costs. A copy of the complaint was served on Jesse B. Wasserman, president of the defendant company, at its place of business, 524 West 50th street. The suit attacks the new tire cover which the Niagra company placed on the market after discontinuing the old style which was made the basis of a suit for infringement filed by the Allen company in November last year, and which suit still is pending. The old cover is alleged to infringe the same patent, No. 799,662.

Denver Company Sues Its Trustee.

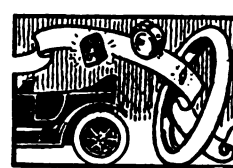
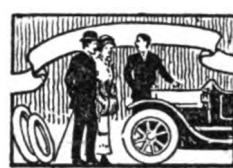
J. A. Pierce, vice-president and trustee of the F. A. Trinkle Automobile Co., of Denver, Colo., has been made defendant in a suit for \$8,579.52 filed by the company, which sum, it is alleged, represents excess salary and the value of certain goods, including seven automobiles. According to the complaint, Pierce sold six Brush cars and one Sampson truck and retained the entire proceeds for himself, with the exception of \$908. He is charged with misappropriation of funds.

Leaves Renault for Simplex Branch.

Having acquired an interest in the Simplex Pacific Coast Agency, Rene J. Marx, for several years manager of the Renault branch in San Francisco, has resigned that office and assumed the general management of the Simplex establishment. The Simplex Pacific Coast Agency recently was formed by George R. Benter, who secured the generous slice of territory during a recent visit to New York.

Alliance Extends Welcome to Spring Tire.

The Davies Mfg. Co., which recently was organized in Detroit to make a patented spring tire for trucks, will locate in Alliance, Ohio. The board of trade of the latter city offered inducements which the spring tire people simply could not resist!



H. W. Freeman has opened salesrooms and a garage on Arch street, New Britain, Conn., where he will show Ford cars.

The Brooke Auto Co. is building a garage and salesroom on Charles street, Wellsburg, W. Va. It has the agency for Michigan cars.

Arthur Seeney has broken ground for a \$10,000 garage to be erected at the corner of Brighton and Sairs avenues, Long Branch, N. J.

Walters & Freeman have opened salesrooms at 1757 Pennsylvania avenue, Washington, D. C. They will handle the Lord Baltimore truck.

Smith Brothers are building a garage and salesroom in Brainerd, Minn., where they will display Buick, Stevens-Duryea and Stearns-Knight cars.

Joseph V. Grant and W. C. Bartlett have formed the Anniston Vulcanizing & Garage Co., in the Alabama city of that name. They will deal in Ford cars.

H. E. and C. D. O'Harrow have formed the O'Harrow Auto Co. and opened salesrooms in the Guel building, Charles City, Ia. They will deal in Mitchell cars.

W. H. Sims, Claude Sims, and A. F. Allen have formed a partnership and opened salesrooms at the corner of Fourth street and Hill avenue, Grafton, N. D.

The Mitchelville Motor Car Co. is a new concern which has "opened up" in the Iowa town of that name. J. B. Uhl and C. C. Cheester are the men behind the enterprise.

The Walters-Heaton Garage, at Annandale, Minn., has been taken over by the Annandale Auto Co., which is composed of J. E. Walters, Frank Heaton, C. H. Schriver.

Bishop & Whitney, of Canaseraga, N. Y., have taken over the garage and taxicab business of Roberts & Son, Baldwin street, Albany, and will continue it in their own name.

The Reid Motor Car Co. has been formed at Quincy, Ill., to deal in Hudson and R-C-H cars. C. L. Reid is manager of the company, with headquarters at 705 Maine street.

O. C. McFarland is constructing a three-story fireproof garage and salesroom at the corner of McAllister and Polk streets, San Francisco, Cal. He has the agency for Mitchell cars.

The Central Garage Co. has been incorporated in Xenia, Ohio, to take over the business of the Central Electric & Supply Co. Jacob Baldner will be manager of the new company.

T. J. Lucas & Son, lessees of the Royal

Roller Rink, Marion, Ohio, are converting the rink into a garage, to be ready in the middle of this month. Jackson cars will be handled exclusively.

A. O. Kickels has purchased the interest of his partner, Henschen, in the Henschen & Kickels Garage, and will conduct the business alone. He has the agency for Studebaker and Haynes cars.

E. S. Williams has sold his interest in the American Vulcanizing Works, 264 West Third street, Pomona, Cal., to S. F. Barnes. The business will be continued under the same style and at the old address.

A. J. Levin has purchased the Virginia House on Virginia avenue, Atlantic City, N. J., and is tearing it down to make room for a large garage. When completed the building will represent an investment of \$30,000.

The Spring Motor & Garage Co. has been formed at Reading, Pa., for the purpose of dealing in automobiles, motors and accessories, with Paul O. Keppelman as manager. Cutting cars will be handled exclusively.

With E. D. Latta as president, the Piedmont Motor Car Co. has "opened up" at 211 South Church street, Charlotte, N. C. The company handles Stoddard-Dayton, Lozier and White gasoline cars, and Rauch & Lang electrics.

Harris & Bliss have purchased the Lockhart Motor Co., of Lockhart, Tex., from Lea Beaty, the owner. E. M. Salley, who operated the business under a lease, left the city to enter the employ of an Eastern agency.

The Ferguson Auto Sales Co. has been organized in Dwight, Ill., to take over the business of E. Burton Orr, who for the past three years has operated a garage and salesroom in that city. E-M-F, Flanders and the New Parry cars will be handled by the new company.

G. E. Hendee, who operates a garage and salesroom at 518 Utah avenue, Atchison, Kans., has purchased the entire business of the Bell-Munson Garage, on Kansas avenue, in the same city, and has consolidated the two concerns. He handles Firestone-Columbus cars.

Heralded as the finest garage in the Middle West, the Horst & Strieter Garage at 1417-1423 Second avenue, Rock Island, Ia., last week was opened to the public. The building is two stories high, 150 x 80 feet, of fireproof construction, and affords room for more than 100 cars.

The Alpena Motor Sales Co. has been formed in Washington, D. C., with the ob-

ject of handling Alpena cars in the District of Columbia, Virginia and Maryland. E. Faber, O. A. Reed and A. T. Potter are the members of the new company, which has located at 1312 Fourteenth street, N. W.

Charles H. Kerr has purchased the interests of Henry Gardett and J. Porter Munsey in the Kern Valley Garage, at Bakersfield, Cal., and will continue the business under the style Studebaker Garage. As the name indicates, cars made by the Studebaker Corporation will form his chief stock-in-trade.

Frank Statz, soda manufacturer of Madison, Wis., has purchased the Pregler Garage in that city. He will continue to handle the agencies held by Pregler, as well as several others, so that his stock-in-trade will comprise Cadillac, Stoddard-Dayton, E-M-F and Flanders pleasure cars, and Crown commercials.

The firm of Staake Brothers, of San Antonio, Tex., has dissolved, and its business will be continued by H. G. Staake, one of the partners. The firm was established in 1849, and has been under its present owners for over 25 years. Originally started as an agricultural implement house, it took on automobiles a few years ago and now covers considerable territory for several popular-priced makes.

Following a petition in voluntary bankruptcy by the Crawford Automobile Co., of New York, Judge Holt, on Tuesday last appointed Wilder Bellamy receiver, with a bond of \$500. The company, which operates a garage at 152 West 56th street, New York City, gives its assets as \$2,585 and its liabilities at \$2,344. The company was incorporated in August, 1910, with a capital stock of \$10,000; Joseph Troxwell is president and treasurer.

Recent Losses by Fire.

Rochester, N. Y.—Garage at 127 State street destroyed. Loss, \$30,000.

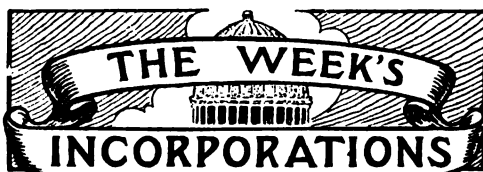
Brooklyn, N. Y.—Long Island Taxicab Co.'s garage, 159 Clymer street, damaged.

West Medford, Mass.—Wm. E. Crosby's garage and two cars burned. Loss, \$3,000.

Pittsburgh, Pa.—Manchester Automobile Garage, Fayette and Charter streets, and 25 cars destroyed. Loss, \$50,000.

Kansas City, Mo.—Dodge-Robinson Motor Co. and Fletcher Cowherd's garage destroyed and 100 automobiles damaged. Loss, \$300,000.

Winnipeg, Man.—International Harvester Co.'s warehouse; Stewart Machinery Co.'s warehouse and several other buildings destroyed. Loss, \$750,000.



Dallas, Texas—Mitchell Motor Co., under Wisconsin laws, with \$5,000 capital; to deal in automobiles.

Springfield, Ill.—The Motz Tire and Rubber Co., an Ohio corporation, admitted to do business in the State of Illinois. Capital, \$50,000.

Washington, D. C.—National Motor Transportation Co., under Delaware laws, with \$1,000,000 capital. Corporators—H. H. Westcott, S. E. Lyon, G. L. Lewis.

Detroit, Mich.—Detroit Auto Training School, under Michigan laws, with \$5,000 capital; to operate an automobile institute. Corporators—C. Brunnar and others.

Racine, Wis.—Piggins Motor Truck Co., under Wisconsin laws, with \$125,000 capital; to manufacture motor trucks. Corporators—C. R. Piggins, F. H. Piggins, E. M. McNab.

Denver, Colo.—Reliable Garage Co., under Colorado laws, with \$10,000 capital; to do a general garage business. Corporators—F. H. Teames, Loring C. Elliott, Andrew B. Strong.

Omaha, Neb.—Storz Automobile Supply Co., under Nebraska laws, with \$50,000 capital; to do a general automobile business. Corporators—Arthur Storz, Hal M. Brady, Donald C. Troup.

Springfield, Ill.—Springfield Auto Sales Co., under Illinois laws, with \$35,000 capital; to deal in automobiles. Corporators—Basil W. Ogg, F. T. Keisacker, L. S. Minegar, R. A. Trumbull.

Columbus, Ohio—Brocket-Gorham Co., under Ohio laws, with \$25,000 capital; to manufacture automobile specialties. Corporators—E. J. Bocket, K. Gorham, George D. Copeland.

Buffalo, N. Y.—Excelsior Sales Co., under New York laws, with \$10,000 capital; to deal in automobiles. Corporators—William F. Hanavan, Henry O. Wait, Leo F. Donnelly, all of Buffalo.

Camden, N. J.—Bonita Manufacturing Co., under New Jersey laws, with \$50,000 capital; to deal in electrical specialties. Corporators—Harold E. Rogers, Frank B. Jess and Adam R. Sloan.

Salt Lake City, Utah—Jeffers Automobile Co., under Utah laws, with \$25,000 capital; to do a general automobile business. Corporators—Albert Jeffers, A. E. Anderson, W. H. Middaugh.

Schenectady, N. Y.—Union Garage Co., under New York laws, with \$20,000 capital; to do a general garage business. Corporators—Charles H. Tetef, Cohoes; Llewellyn M. Miller, Bertram V. Tulloch.

New York, N. Y.—Bussing Agency, Inc.,

under New York laws, with \$50,000 capital; to deal in automobiles. Corporators—George Ozanne, Albert C. Baldwin, John V. Knoth, all of 1777 Broadway.

New York City—The Connell Company, under New York laws, with \$2,000 capital; to deal in automobiles. Corporators—John F. Connell, 3270 Decatur street, Brooklyn; Wm. J. Connell, 555 Boylston street.

Indianapolis, Ind.—Empire Automobile Co., under Indiana laws, with \$100,000 capital; to manufacture automobiles. Corporators—C. E. Gibson, C. B. Sommers, Aaron Weldheim, David Sommers, David May.

Columbus, Ohio—Roberts Supply and Tire Co., under Ohio laws, with \$10,000 capital; to deal in automobile supplies. Corporators—Don P. Mills, R. W. Sanborn, Paul S. Knight, M. Marquard, M. W. Spear.

Clyde, Ohio—Brebs Commercial Car Co., under Ohio laws, with \$100,000 capital; to manufacture motor cars and gas engines. Corporators—B. A. Becker, J. C. L. Brebs, Frank K. Bachie, Homer Metzgar, George S. Lessman.

New York, N. Y.—Alhambra Garage Co., under New York laws, with \$10,000 capital; to do a general garage business. Corporators—Joseph C. Graveur, 65 West 118th street; Martha Graveur, Gordon W. Kenney, 1921 Seventh avenue.

Buffalo, N. Y.—Dayton Airless Tire Sales Co., under New York laws, with \$10,000 capital; to deal in automobile tires. Corporators—John Schoepflin, Hamburg, N. Y.; J. Louis Seligman, Buffalo, and Albert Stratemeier, Hamburg.

Salem, N. J.—Salem Automobile Service Co., under New Jersey laws, with \$25,000 capital; to operate automobiles for hire. Corporators—G. D. Jaquette, A. Lawrence, of Salem, and C. F. Jaquette and W. E. Allen, of Atlantic City.

New York City—Jandorf Automobile Co., under New York laws, with \$10,000 capital; to deal in automobiles. Corporators—Louis C. Jandorf, 116 Riverside Drive; Howard R. Bliss, Richmond Hill; Sidney S. Meyers, 520 West 114th street.

New York, N. Y.—Reliance Rubber Co., under New York laws, with \$1,000 capital; to manufacture tires, etc. Corporators—J. B. Bacon, 212 Broadway, New York; S. R. Simpson, 345 Fifth avenue, New York; J. W. Ebbs, Englewood Cliffs, N. J.

New York, N. Y.—Rago Motor Co., under New York laws, with \$20,000 capital; to manufacture automobiles. Corporators—George C. Andrews, 1 Madison avenue; E. C. Gorham, 220 West 49th street; Thomas F. Farrell, of Jersey City, N. J.

Brooklyn, N. Y.—Long Island Commercial Car Co., under New York laws, with \$9,000 capital; to deal in automobiles. Corporators—Chas. F. Lewis, 12 Waldorf Court; Chester I. Crowell, 574 Fifth street; Conrad A. Moller, 86 Rogers avenue.

New York, N. Y.—Packard Pleasure Car Renting Co., under New York laws, with \$1,000 capital; to rent automobiles. Corporators—James Kennedy and Mary Kennedy, both of 229 West 121st street, and Edmund J. Shelley, 408 East 140th street.

Elkins, W. Va.—Elkins Automobile Supply Co., under West Virginia laws, with \$5,000 capital; to do a general automobile supply business. Corporators—Thomas Donohue, G. W. Adamson, E. D. Talbott, W. C. Posten, S. O. Billings, all of Elkins.

Chicago, Ill.—Chicago Cycle Supply Co., under Illinois laws, with \$15,000 capital; to manufacture and deal in bicycle and automobile accessories. Corporators—Hans P. Hanson, Charles J. McCormack, Richard J. Collins, all of 69 West Washington street.

New York City—Auto Selling Co., under New York laws, with \$5,000 capital; to deal in automobiles. Corporators—Theo. D. Raymond, 674 West street, Brooklyn; Joseph Greenberg, 1353 40th street, Brooklyn; Charles H. Strieb, 674 West street, Brooklyn.

New York, N. Y.—Fresh Air Auto Heating Co., under New York laws, with \$1,000 capital; to manufacture automobiles and appliances. Corporators—J. Robinson Duff, 60 Broadway; Sherman Matthews, 63 West 106th street; B. A. Westervelt, 455 West 153rd street.

Brooklyn, N. Y.—South Brooklyn Auto Livery and Sales Co., under New York laws, with \$15,000 capital; to do a general automobile garage and sales business. Corporators—Claus Hohorst, 498 9th street; John B. Heff, 331 13th street; Chas. H. Hohorst, 498 9th street.

New York, N. Y.—Ess Auto Corporation, under New York laws, with \$500 capital; to do a general automobile supply and sundry business. Corporators—John P. Morris, Jersey City, N. J.; Herman Ottenberg, 172 Hews street, Brooklyn, N. Y.; Leo Hecht, 15 Livingston place, New York City.

Camden, N. J.—Peerless Roller Bearing and Appliance Co., under New Jersey laws, with \$300,000 capital; to manufacture automobiles, motor trucks, roller bearings, etc. Corporators—P. E. Sharpness, Ward, Pa.; W. H. Kneedles, Lansdale, Pa.; I. Michner, Jenkintown, Pa.; W. J. Moore, Philadelphia, Pa.; J. R. Jarrett, Haddonfield, N. J.



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POOHPOOHING THE ELECTRIC VEHICLE.

Almost in the same breath in which they express fear of the "American invasion," which invasion, of course, applies to gasoline cars, there are men and publications identified with the automobile trade of Great Britain that poohpooh the suggestion that the electric vehicle has even a remote chance of success in their "tight little isle."

Commenting on a favorable expression of opinion regarding the electric vehicle, to the effect that with electric current so cheaply available there is no reason why electric vehicles should fail in England while they are successful in America, one of these skeptics has induced himself to believe that it is due to the absence of good roads in America that the electric vehicle has met with such a measure of success, the roads being such that the use of automobiles of all types largely is restricted to the limits of cities and towns. In substance, he says, that it is because we cannot go far afield that we use electrics, which, if true, probably would result in their general use. This British doubter would have his countrymen imagine that it is because the roads in the United Kingdom are generally so very much better than the roads of America, and long distance travel thus facilitated, there is no room for the electric vehicle.

It is such opinions as these that make appear not impossible that some day John Bull may have cause for another shudder when the American electric vehicle makes its appearance on his shores, and when he may see in it another "invasion." For good roads and good streets promote the use of electrics even more than they promote the use of gas cars, and as always and everywhere there

comes a time when no small number of motorists weary of chauffeurs and tire of "exploring" the same old roads within a day's travel and when they begin using automobiles in that sane fashion in which horses and carriages were or are used, with cheap current and charging facilities available, it is not easy to understand why the safety, the cleanliness and ever-readiness and the general serviceability of the electric vehicle in the hands of every member of a family, cannot be made to appeal to such people wherever good roads or good streets prevail.

LICENSING PATENTEES TO RUN AMUCK.

It is safe to say that even the late Mark Hanna, who declared that the only real trust was a United States patent, and who knew more than the proverbial thing or two about trusts, never dreamed of such monopolies as are rendered possible by the decision of the United States Supreme Court in the Dick mimeograph case, which has set the country by the ears. Whatever may be the case with certain types of patentees, it is fairly certain that few manufacturers or merchants will welcome such a state of affairs as is created, and that all will be profoundly gratified if a way is found to reverse the decision.

Carried to its logical conclusion, and as it applies to the automobile industry, it would, for instance, enable the patentee of, say, an engine, not merely to control the manufacture, distribution and price thereof, but would enable him to specify the particular oil, or magneto, or spark plug that must be used, or even the radiator or chassis to which the engine must be applied, and to require that the goods be bought from a particular person.

Undoubtedly they are wise and learned heads that evolved the decision, but, practically applied, it would lead to commercial chaos. Patents have been described, and not inaptly, as licenses to sue. The Dick decision, however, is equivalent to licensing patentees to run amuck, if they incline that way.

EQUALIZING BOTH SETS OF BRAKES.

Viewing braking mechanisms in the concrete, general improvement is apparent, as is but natural in view of the advances which have been made in other respects. There still is room for inventive genius, however, and probably the plainest marked road to betterment is indicated by the necessity for equalizing the efficiency of both sets of brakes, service and emergency.

There are few cars, no matter what their age may be, which boast brakes both of which are capable of bringing the car to a full stop within the same distance traveled after they have been set. And though it may be argued that the emergency brake, for instance, really ought to be the more powerful set of the two, such is not the case. For if it requires a greater braking strain to bring the car to an emergency stop using only one set of brakes, that set should be the service set for the reason that the average driver is more familiar with the foot brakes, and cases have been known where in an emergency the hand applied brakes have been forgotten in the excitement of the moment. It scarcely is necessary to add that if the service brake is as powerful as it should be to meet such exigencies, there will be no necessity for emergency brakes that are even more powerful; neither should they be less powerful for equally obvious reasons.

Apparently, those manufacturers who have elected to use twin internal expanding brakes have hit upon the best solution of the problem, for not only may the efficiency of both sets be equalized positively, but interchangeability also is promoted and permitted.

MAKES EACH PATENTEE A "TRUST"

United States Supreme Court Delivers a Revolutionary Ruling by a Divided Vote—All Business Affected.

Unless it is reversed in a rehearing which it is expected will be applied for and granted, or the patent laws of the United States are amended, according to a decision of the United States Supreme Court on Monday, 11th inst., a patentee hereafter may enjoy not merely a monopoly involving his own patented article, as is sought to be established by law, but may become a far reaching trust within himself. By the terms of the decision, which has aroused the entire country, the patentee of any article is given the right not merely to fix prices and to choose his market, but also to force users of the article to purchase for use with it only specifically designated equipment or supplies from an indicated source, whether they are patented or unpatented. Although not wholly unprecedented, the decision really is almost revolutionary, and so far reaching are its influences that it virtually authorizes monopolies, despite the Sherman anti-trust law, and permits them to grow up and be tried only under the patent laws, regardless of general laws and public policy.

The case in which the astonishing decision was handed down was that of the A. B. Dick Co., an Illinois corporation owning patents on a rotary mimeograph or duplicator, against Henry Sidney, et al., a co-partnership which sold a mimeograph and a supply of ink to one Christina B. Skou. The A. B. Dick Co. brought suit to recover damages, alleging contributory infringement of its patents in that the ink sold by Sidney et al. was other than that manufactured by the Dick company and specified in the selling license attached to the mimeograph as the only ink to be used with it. The ink is unpatented.

Lending additional interest to the case, the decision was rendered by a majority vote of one member of the court, the opinion being written by Associate Justice Lurton and concurred in by Associate Justices McKenna, Holmes and Vandevanter. Chief Justice White and Associate Justices Hughes and Lamar dissented, Associate Justice Day being absent because of the death of his wife, and Associate Justice Harlan's place being as yet unfilled, though his successor has been named but not confirmed by the Senate.

In handing down the decision the majority opinion of the court takes strong ground in sustaining the validity of the Dick patents. "The right to sell under restrictive conditions" says the court, "is part of the monopoly sought to be established by the patent laws under the authority of the Constitution, and an infringement of the con-

ditions is essentially an infringement of the patent right. Redress may therefore be sought under the patent laws, the general law to the contrary notwithstanding and the public policy of the State being what it may."

In dissenting, Chief Justice White criticised sharply the decision, principally on the ground that the case was tried under the patent laws, when the ultimate effect goes so far beyond the rights conveyed by patents.

"My reluctance to dissent," said Justice White, "is overcome in this case. First, because the ruling now made has a much wider scope than the mere parties to this record, since, in my opinion, the effect of the ruling is to destroy in a very large measure the judicial authority of the States by unwarrantedly extending the Federal judicial power. Second, because the result just stated, by the inevitable development of the principle announced, may not be confined to sporadic or isolated cases, but will be as broad as society itself, affecting a multitude of people and capable of operation upon every conceivable subject of human contract, interest or activity, however intensely local or exclusively within State authority they otherwise might be.

"Third, because the gravity of these consequences which would ordinarily arise from such a result would be greatly aggravated by the ruling now made, since the ruling not only vastly extends the Federal judicial power, as above stated but as to all the innumerable subjects to which the ruling may be made to apply, makes it the duty of the courts of the United States to test the rights and obligations of the parties not by the general law of the land, in accord with the Conformity act, but by the provisions of the patent law, even although the subject considered may not be within the embrace of that law, thus discarding the State law, overthrowing, it may be, the settled public policy of the State and injuriously affecting a multitude of persons.

"Lastly, I am led to express the reasons which constrain me to dissent because of the hope that if my forebodings of the evil consequences to result from the application of the construction now given be well founded, the statement of my reasons may serve a twofold purpose. First, to suggest that the application in future cases of the construction now given be confined within the narrowest limits, and, second, to serve to make it clear that if evils arise their continuance will not be caused by the interpretation we now give to the statute, but will result from the inaction of the legislative department in failing to amend the statute so as to avoid the evil."

Holding that if a breach of the restriction be held to support a suit for infringement of patent rights parties will be deprived of the right to have the validity of general import of the restriction determined by the general law, the majority opinion replied:



March 12-16, Denver, Colo.—Annual show in the Denver Auditorium under the auspices of the Automobile Dealers' Association.

March 12-16, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fourth annual show in the State Armory.

March 13-20, Boston, Mass.—Boston Commercial Vehicle Association's show in Mechanics' Hall.

March 17, San Jose, Cal.—Track race under the auspices of Emile Agraz and W. T. Buehren.

March 25-30, Indianapolis, Ind.—Indianapolis Automobile Trade Association's first annual show in a tent auditorium covering University Park Square.

"We are unable to assent to these suggestions. We do not prescribe the jurisdiction of Courts, Federal or State, but only give effect to it as fixed by law. If a bill asserts a right under the patent law to sell a patented machine subject to restrictions as to its use, and alleges a use in violation of the restrictions as an infringement of the patent, it presents a question of the extent of the patentee's privilege, which, if decided one way, brings the prohibited use within the provisions of the patent law, or, if determined in the other way, brings into operation only principles of the general law.

"The jurisdiction of circuit courts over such cases has been for more than a century exclusive by the express terms of the statute, although for the most part its jurisdiction over other kinds of suits arising under the Constitution and laws of the United States is only concurrent with that of the State courts.

"That a patentee may effectively restrict the time, place or manner of using a patented machine, so that a prohibited use will constitute an infringement of the patent is fully conceded.

"The conclusion we reach is that there is no difference in principle between a sale subject to specific restrictions of the time, place or purpose of use, and restrictions requiring a use only with other things necessary to the use of the patented article, purchased from the patentee.

"These limitations are merely the respect paid, and the effect given to those conditions of transfer of the patent articles which the law, laid down by statute, gave the original patentee a power to impose. Whether the law on this head should be changed and the power of sale *sub modo* should be withdrawn or limited is not a question for a court."

FOR A NATIONAL BOARD OF TRADE

President Taft Takes Initiative and Outlines Scope of Work—Invites Trade Bodies to Meet Next Month.

Due to the initiative of President Taft, and under the auspices of the United States government itself, an effort will be made on April 15th next to bring about the organization of what practically will be a National Board of Trade, or National Chamber of Commerce, which, in spirit and in some of its works at least, will be akin to the British Board of Trade; but, necessarily, without its scope and authority.

The call for the meeting to occur in Washington on that date has been issued by Secretary Nagel, of the Department of Commerce and Labor, to the various commercial and industrial associations in this country, all of which are invited to send delegates to the meeting.

In the memorandum issued from the White House, President Taft remarks that he communicated the idea to Congress on December 7 last in a message on foreign relations, in the course of which he expressed his belief that "it would be of great value to have some central organization in touch with the association and departments of commerce throughout the country, and able to keep purely American interests closely in touch with commercial affairs." In this memorandum, which accompanies the invitation issued by Secretary Nagel, the President calls attention to the fact that several attempts have been made in the past to organize commercial bodies upon a national basis, but that these efforts have not met with success. He attributes the reason for their failure chiefly to the fact that none of these associations or general organizations has been of a character to make it possible or proper for the government to recognize it as representative of the commercial and industrial interests of the country. Believing, therefore, that government initiative and assistance are absolutely indispensable to such a project, the President has taken the initiative himself and instructed the Secretary of Commerce and Labor to take the necessary steps for a general representative meeting.

Such an organization, the President declares, properly represented at the seat of government could be of incalculable assistance in advising the executive branch of government with respect to the methods and rules to be adopted in the administration of existing law. It could be of like assistance in giving advice in regard to proposed new legislation and in counseling representatives of the executive branch when asked to submit recommendations upon bills introduced and pending before committees. Such an organization would

be in the best possible position to suggest fields for new inquiry at home and abroad, the methods by which such inquiries should be pursued, and the means by which results can be most advantageously brought to the attention of our merchants and manufacturers; and it is safe to assume that if such an organization is created its chief activities will be developed in the light of our own experience. It may not be necessary that we adopt a course in all respects patterned upon the system of any other commercial or industrial country, but it is obvious that by some means immediate relation between the government activities and the commercial and industrial forces of our country must be established if we propose to enjoy the full advantage of our opportunity in domestic and foreign trade.

Matheson Tries New Selling Campaign.

Instead of conducting the bulk of its business by means of agencies in various parts of its selling territory, as other automobile companies do, the Matheson Automobile Co., of New York City, will cover the territory east of the Alleghenies with field crews of its own employees. Each crew is composed of two salesmen and one mechanical expert, traveling in three demonstrating cars of different types, so as to make a traveling display of the company's standardized models. The first of these crews left on Monday last week, and will shortly be followed by similar crews bound for northern New York State and New England. The squad will call on Matheson owners, give advice or aid, if required, and visit agents and also inquirers, and if the results obtained are satisfactory, it is intended to start further parties on the "warpath."

Gasolene Comes High in London.

Small comfort, perhaps, may come to those who incline to rail at the "high cost of gasolene" in and about the larger American cities from figures quoted by the British Petroleum Co., which supplies the greater portion of the petrol used in London and environs. The retail price of "motor spirit," as it is styled in the British capital, now is 32 cents a gallon. It is put up in one gallon cans under the registered trademark "Shell," and a cheaper grade, trademarked "Crown," sells for 29 cents a gallon—prices applicable to London only.

Detroit Bids for S. A. E. Convention.

Detroit is making an effort to secure the annual midsummer convention of the Society of Automobile Engineers, which last year occurred in Dayton, Ohio. The Detroit Convention Bureau, which is the moving spirit in such matters, has forwarded the necessary invitation to the S. A. E. officials, the invitation being supplemented by communications from the Detroit city officials, from the Board of Commerce, the Wolverine Automobile Club and other Detroit organizations.

MISS KNIGHT TALKS OF INVENTIONS

Double Sleeve Engine of 1896 Then Considered of Small Moment—Her Views of Charles Y. Knight's Motor.

It is safe to say that during recent years, at least, no gasolene engine so quickly attained prominence as the "K-D," or Margaret E. Knight sliding crescent valve motor, which first made its appearance at the Boston Show on Saturday, March 4th. The fact that it is the invention of a woman was sufficient to invest it with an element that provoked curiosity and to attract to it at least casual attention, but despite the fact, the motor at first received scant notice and did not become famous in a night. It required a week within which to acquire its fame.

It was not until the appearance of the last issue of the Motor World, in which the engine itself and its antecedents and surroundings were dealt with, that there arose a keen desire to see it and to know more about it and its history, and particularly the "1896" sleeve valve engine which also was a part of the Margaret E. Knight exhibit, and the likeness of which to the already famous production of Charles Y. Knight, patented many years later, is plain to see. The similarity of the names and types suggested that the two Knights were of the same family, and the fact that the invention by the female of the species had occurred so long before the invention by the male appeared to convey a train of uncommon significance that must reach across the sea, where the Charles Y. Knight device is so well established.

The fact that Miss Knight herself is averse to being interviewed, and that questioners were referred to her niece, Miss R. E. Davidson, did not add to the satisfaction of the situation, but finally Miss Knight's reserve—and unfeigned reserve it is, too—was overcome, and with considerable reluctance she put aside her aversion to appearing in print—self-glorification, she called it—and it was to the Motor World she accorded her first interview.

In appearance, Miss Knight, who resides in South Framingham, Mass., suggests the inventor little if any more than other women suggest it. She is a rather tall, strongly built, white-haired woman, in her sixties, and is gentle spoken; and there is no room for doubting that desire for "self-glorification" constitutes little of her make-up. Had it been otherwise, in these days of publicity, she might now be courting her million, if not millions, for she has invented a number of mechanical contrivances which are and have been in use for a generation, if not generations—contrivances applying to cotton, shoe and rubber machinery, among other things, and which were sold for nominal sums, as affluence was not Miss

Knight's portion. Her wealthy relatives, the Davidsons, now are backing her and the situation is different.

"I suppose it does appear odd," she said, "that a woman should figure as an inventor of an engine; but in my case it came naturally. I was inclined that way, and have had to do with machinery almost all of my life. The two motors exhibited at the automobile show are but two of many which I devised; in fact, I have obtained patents on no less than 87 of them. I have dealt with all types—steam, internal combustion, hot air and pretty much everything else that has been thought of.

"Yes, I have devised even a gas turbine and a gas rotary engine, and the latter is of the double sleeve principle, too. Somehow it seems as if I have leaned toward the double sleeve principle, but I thought nothing particularly of it. It is not new. The Corliss steam engine of 40 years ago employed double sleeves and they were used even in water pumps. The wonder is that at this time anyone could obtain a patent on even a gas engine embodying that principle.

"I certainly had no idea that the '1896' engine which was exhibited at the automobile show had any particular virtue or any particular value. I originated it in the natural course of things and used it in working out experiments with fuels which I had in hand. I have experimented with all of them—gasolene, benzine, kerosene, acetylene and everything else, I guess. It was in seeking to obtain a satisfactory gas from the heavy distillates that I used my 1896 sleeve valve engine; but, as I said, I attached no particular value to it."

"Did you ever apply for a patent for it?" inquired the Motor World man.

"I am not certain, but I think that specifications were drawn up. But I had three lawyers and if my application ever got to Washington it probably was lost. As a matter of fact, at about that time I was in the hospital for the better part of two years. I underwent a severe operation and when I left the hospital my home had been broken up, my papers and mechanical parts had been scattered, and my purse was empty.

"No; the '1896' motor which was exhibited at the show is not the one that was in existence at that time. It may contain some of the parts, but it was built three or four years ago. But I have a living witness of the truth of my statements. He is Alfred D. Abbenzeller, of Randolph, Mass., who worked for me and who, while I was in the hospital, had many of my tools, and who had seen the draft of my engine and had parts of it and had asked what they were. I also have some of the original letters bearing on the engine."

"Have you any idea of instituting action for infringement against Charles Y. Knight?"

"None whatever," replied Miss Knight. "Strange as it may seem, I have never seen

Mr. Knight's engine, despite the fact that it was exhibited even at the Boston show. I purposely refrained from looking at it so that if ever I appear on the witness stand I will be in a position to make oath to the fact."

"Does that imply that you would defend an action if Mr. Knight brought one?"

Miss Knight smiled and stated that she meant exactly that thing.

Mention of the name Charles Y. Knight did not serve to arouse the lady nearly so much as first reports made appear probable. In fact, it aroused her scarcely at all. She betrayed no resentment and spoke of him and his invention in an unexpected spirit of fairness, and with only an occasional trace of irony in her tone.

"He has a good motor," she said, "but I think my crescent valve motor is a better one," and she said it without even a suggestion of boastfulness.

"Is there any truth in the rumor that Mr. Knight is one of your nephews?" she was asked.

"I suppose all Knights are of the same stock," she replied, "but if he is my nephew I do not know it. I understand he was born in Salem, Mass., but if I ever met him it was long ago and he has probably forgotten me. I have no recollection of ever having seen the gentleman."

"How do you account for the similarity of your 1896 motor and his present sleeve valve invention? Had he seen your invention or had opportunity to acquire knowledge of it?"

"Perhaps it was a dream on his part," Miss Knight replied with a gentle smile "or it may be that it was merely a coincidence. Such coincidences are by no means rare; it frequently has happened that two people, far distant from each other, have devised practically the same contrivance without knowledge of each other; it is not impossible that this is a case of the sort. I had work done in a number of shops in New England and some of my inventions have been exhibited in several schools—the Case School of Applied Science, in Cleveland, for instance—and you know how it is in matters of that kind; workmen acquire knowledge of inventions, drawings and parts become scattered and in that way information frequently gets beyond the control of the inventor himself. I understand that Mr. Knight was in the butter and egg business, or rather was the editor of a butter and egg journal when he invented his engine and I simply know that my engine, at least, was not hatched out of an egg." And again Miss Knight smiled the same gentle smile.

Landlord, Tenant and Broadway Rentals.

The influence of the skyward tendency of Broadway rentals was reflected last week in a case decided by the New York Court of Appeals in favor of the Palmer & Singer Mfg. Co., and the Knickerbocker Garage and against the Barney Estate Co.,

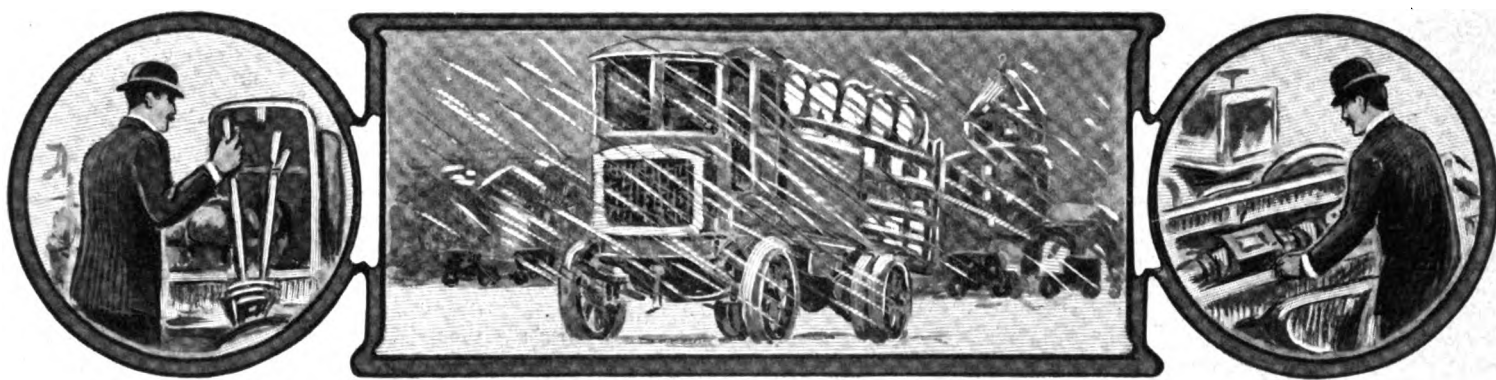
of New York, which latter in 1906 leased to the plaintiffs the premises, 1618-1620 Broadway, at an annual rental of \$19,500. In February, 1910, when the rent was 22 days overdue, and two demands having been made for it, Palmer & Singer tendered payment at the Barney office, but the money was refused. They tendered it again, but again it was refused, and in March the Barney interests applied for a dispossess order against the Palmer & Singer company, alleging non-payment of rent. In open court Palmer & Singer again tendered the amount due, but when the landlord declined to receive it the Municipal Court dismissed the application for the dispossess order. The Barney Estate Co. appealed and a new trial was ordered, but the tenants secured an injunction restraining the landlord from taking further action until the appeal was argued. The landlord also appealed against this injunction but it was affirmed. The Court of Appeals rendered its decision in the dispossess proceedings last week and as it was conceded that the attitude of the Barney estate was influenced by the higher rental value which the property had attained since the lease was executed the court took occasion, mildly at least, to chastise the landlord for his action.

Uncle Sam Sues New Yorkers for \$10,000.

Two suits for \$10,000 each have been entered in the United States District Court for the Southern District of New York against the Stearns Automobile Repair Co., of New York City, and the Anthony Auto Body Co., of 353 West 52d street, New York, respectively. According to the complaint drawn up by Attorney-General Wise, the two concerns, which are organized under the laws of New York, have failed to file their annual statement and report, due on December 31, 1910, and despite repeated requests, which were made previous to and including March 1, 1911, have omitted to comply with the corporation requirement and flatly declined to furnish the statements. For this infraction of the corporation laws they are liable to a penalty of not less than \$1,000 nor more than \$10,000, and suit for the maximum amount has been brought against them.

Oakland Opens Three More Branches.

Three new branches have been opened by the Oakland Motor Car Co., of Pontiac, Mich., at Atlanta, Ga., Kansas City, Mo., and San Francisco, Cal., in charge of Morgan Morgans, T. N. Shambaugh and Henry L. Hornberger, respectively. The territory covered by the Atlanta branch consists of nine States, namely: Mississippi, Louisiana, Alabama, North Carolina, South Carolina, Georgia, Tennessee, Arkansas and Florida. The Kansas City branch covers territory consisting of Missouri, Kansas, and the Texas Panhandle. The San Francisco branch covers territory consisting of Northern California and the State of Nevada.



FIVE NEW TRUCKS APPEAR AT BOSTON SHOW

One a Steam Vehicle, One a Gasolene "Six" With Two Clutches and One a Front-Drive Electric — Thoroughly Representative Display But Show Opens With Surprising Evidence of Unpreparedness — Despite Unfavorable Weather Conditions, Tremendous Crowd Marks First Night.

Satisfied—well-nigh satiated—by a whole week of pleasure car show, and willing, almost desiring the change, Bostonians last night (Wednesday) were treated to the transition from pleasure cars to commercial vehicles which has become the order of the "big shows," of which the Boston exhibition ranks as one of the very biggest. But it is the first time that Boston can boast a real commercial vehicle show, separate and apart from pleasure car displays and containing motor trucks exclusively, not counting accessories, of course, and the reception accorded the innovation was such as ought to warm the cockles of any show promoter's heart.

From the time the show was opened at 7:30, until it was closed at 10:30—and they had to turn out the lights to instil into the minds of interested spectators that it really was past bedtime—a steady stream passed the ticket takers at the several entrances to Mechanics' Hall, and it did not take long for the two big halls and the basement to fill almost to overflowing. Whether or not all those who sidled and squeezed along the aisles paid real money to get in is a matter for the promoter to decide. But at any rate it scarcely seems within the scheme of things that the average boy between the ages of 10 and 15 willingly would part with the necessary 50 cents merely to see an aggregation of motor trucks and accessories, regardless of how interesting they are to others of an older and riper experience. Be that as it may, there were plenty of "kids" and "kiddies" there on opening night, and they were very much in evidence, catalog collecting mostly, as is the bent of the kind, and making themselves a nuisance in general to exhibitors and spectators.

Not all the crowd was made up of juve-

nile Edisons and Westinghouses, however. A goodly portion of it included well-to-do business men—and women—congregated with serious intent, but some of them at least did not see all they went to see. Despite the fact that four whole days intervened between the closing of the pleasure car show on Saturday night, 9th inst., and the opening of the commercial car section, a surprising state of unpreparedness was revealed. All day Wednesday it rained—not the gentle kind, but real rain—and it did not let up in the evening. But still the trucks were piled in, though when the doors finally were opened well-filled exhibition spaces were conspicuous by their absence. Big blanks everywhere were in evidence, though the show-goers as a rule scarcely seemed to notice the discrepancy. There was one thing that the torrents of rain did not do, however. It did not deter the Bostonians from making the trip to Mechanics' Hall, and perhaps the blank spaces, which, by the way, will be filled when delayed shipments arrive, were a blessing in disguise, for they permitted the crowds a little more "breathing space." Until Saturday night, 20th inst., the show will be open from 10:30 in the morning until 10:30 at night, and if the crowd which attended on the opening night may be taken as an indication, the attendance at the commercial vehicle show will come close to the record set last week.

There were the usual opportunities for the people to stop and exclaim "Oh" and "Ah." There was a big Morgan coal truck with a load of peanuts which were ejected through the revolving screw chute to show that the mechanism would not smash and powder coal, and were returned to be recirculated—all except occasional handfuls that found their way into sundry pockets.

Show-going Boston gave attention to the hoisting bodies of the dumping trucks, the running motors of some of the electric cars, the bright red fire apparatus—and the Ladies' Orchestra, which was roundly applauded after every effort. And the patriotic Bostonese crowded around two new machines that were beautiful only from a mechanical point of view but were brand new machines, and, moreover, were "made in Boston." One of these, the Eckhard five-ton gasolene truck, fairly bristles with novel features from its six-cylinder motor to the double sprag at the rear. Built by the Hercules Motor Truck Co., of Boston, and designed by John Eckhard, general manager of the company, the machine shows evidence of no little ingenuity. The first feature to catch the eye, after the six-cylinder 48-horsepower motor, is the transmission system. There is a three-speed change gear selectively controlled, and the usual clutch between it and the engine; but in addition there is a clutch at the rear of the gearbox. The two clutches are so interlocked that both are thrown in and out together. The result is that when the clutch is thrown out for the purpose of changing gears the gears are perfectly free, and, furthermore, they are brought to a standstill as soon as the gear shifting lever is placed in neutral position, by a little brake which is automatically released when the gears are again meshed. Therefore, there is no grinding or clattering when changing gears, for none of the gears are rotating. The ends of the teeth are well rounded to permit easy engagement. Final drive is by countershaft and heavy side chains; the drive is transmitted to the body through stout radius rods, and both ends of the springs, carried in hooded brackets, are free. The torsion rod is worked out in

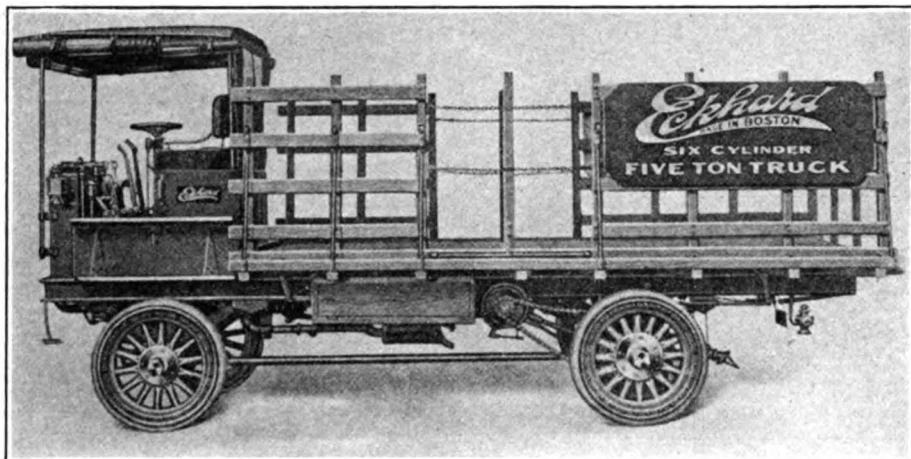
a peculiar way. Instead of the usual comparatively short rod, there is a very long one, extending from the center of the rear axle to the center of the dropped front axle. There also is a torsion chain—a chain running from a vertical arm on the rear axle to a bracket on the rear end of the frame. The effect of this double arrangement is to remove from the springs not only all driving and torsional strain,

way that boiler tubes are expanded. The tubes are made unusually heavy, and the lack of radiation due to the thick walls is made up for by using many tubes. A sort of grid of iron forms a protection for the radiator and at the same time serves to support the stanchions which carry the front end of the permanent roof over the driver's seat. Back of the radiator is a fan which has bucket-shaped blades and is

signer states, makes it impossible for the shafts to get out of line no matter how much the frame may "work" or twist, the linkage automatically compensating for all movement.

All wheels are 40 inches in diameter; the front wheels have 5-inch single tires and the rear wheels 4-inch duals. Brakes are large, as befits a big truck, and are equalized through an ingenious linkage which makes close adjustment unnecessary.

Not far from the Eckhard truck is the new Stanley steam commercial vehicle, represented by two models, identical as to chassis but different as to bodies, one having a wing-sided express body to carry 2,000 pounds and the other a bus carrying 11 passengers besides the driver. The front ends of both these machines are of the rounded form so familiar in Stanley cars, only a little larger to accommodate the bigger boiler. The power plant is the same as is used in the regular Stanley seven-passenger pleasure car, and is rated at 30 horsepower at a steam pressure of 125 pounds, while by raising the pressure to 500 pounds—which sounds alarming but is mentioned in the most nonchalant way by the salesman—the power rises accordingly. The engine and boiler are similar to those used in the famous Stanley racer which a few years ago made such an amazing record at Ormond Beach. The wheelbase of the commercial chassis is 136 inches; all

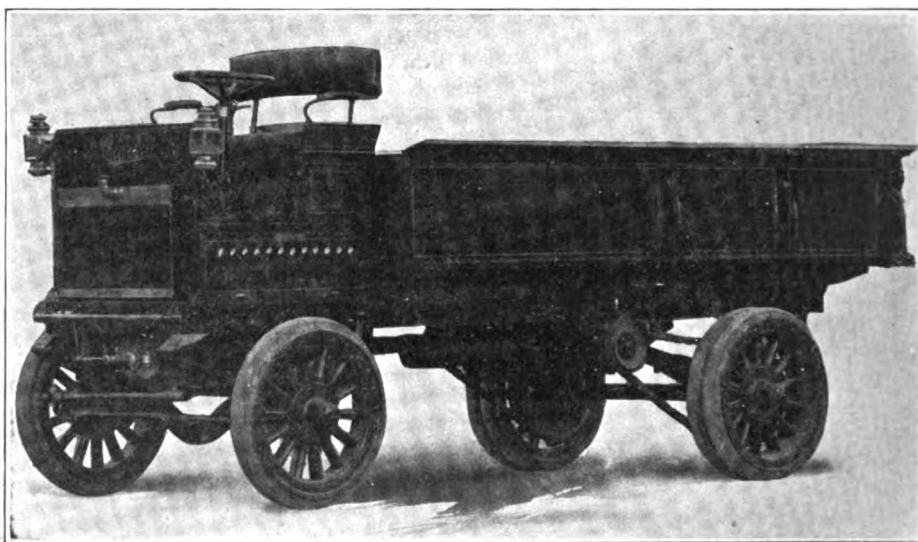


ECKHARD SIX-CYLINDER TRUCK WHICH EMPLOYS TWO CLUTCHES

but to relieve them of all strains due to bumping into curbs or the like. No end of trouble has been taken with the engine, which has a bore and stroke of $4\frac{1}{2} \times 5\frac{1}{2}$ inches, respectively, and on its brake test gave an output of 54 horsepower at 900 revolutions per minute. The cylinders are cast in pairs and all the valves are placed in the head, each valve in a separate cage, and all are actuated through pushrods by a single camshaft on the right hand side. By removing one nut, which releases a yoke, both valve cages of one cylinder can be removed. The rocker arms are of bronze and the pins of hardened steel; oil ducts drilled through the rockers carry lubricant from an oil well to the pins. Contact with the valve stem ends is effected by hardened steel rollers. An interesting bit of refinement is seen in the valve-lifters and guides, which are square and are beautifully fitted. Like the valve cages, the guides are held in place by yokes, a yoke to each pair. The forward end of the camshaft drives through a nest of bevel gears the oil pump, governor, magneto and water pump, the gears being enclosed in a bronze casing which also houses, in an upward extension, the governor, of the centrifugal type. The centrifugal water pump is conspicuous because of its size, it being much larger than the average circulating pump.

Another noticeable feature is the radiator, which is extremely heavy and substantial, and is bolted direct to the main frame, its construction obviating the necessity for spring suspension. The top and bottom water spaces are of heavy cast bronze, and into them copper tubes, carrying the usual radiating flanges, are expanded in the same

capable of moving a tremendous amount of air through the cooling tubes. The driver's seat is mounted over the motor. A detail that has to be looked for is the suspension



THREE-TON CLARK OPEN EXPRESS BODY TRUCK

of the rear end of the motor sub-frame and the front end of the gearbox sub-frame. A heavy cross frame is put in just where the two sub-frames end, and a pivot at the center of the cross frame carries two yokes, one at the front of the frame and the other at the back. From the ends of each yoke hang short pivoted links which are pivoted also to the ends of the sub-frames, the rear end of the motor sub-frame being carried by the yoke at the front of the cross frame and the front end of the gearbox frame by the other yoke. The result is a suspension which, the de-

wheels are 36 inches in diameter and are fitted with $4\frac{1}{2}$ -inch pneumatic tires. Springs are full elliptic all round. On a stand was shown a Stanley fire-tube boiler, complete with its maze of pipes and its glittering valves and gauges, and an extremely handsome nicked two-cylinder engine. The boiler, as is well known, is wound with piano wire at high tension, and this winding was the object of considerable curiosity on the part of the show-goers.

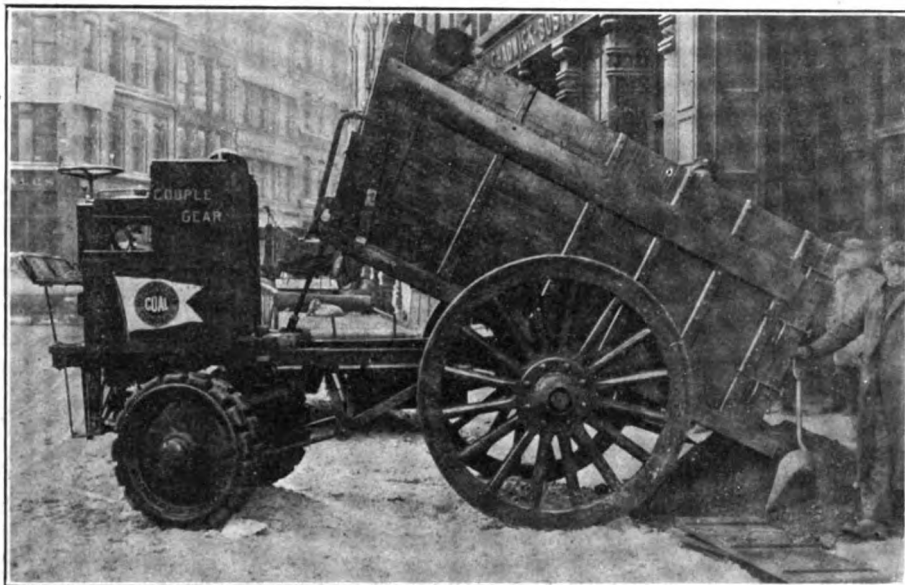
The Clark gasoline car, another new arrival, is interesting for two reasons; it is

made in Boston—as set forth in shining brass script on its radiator—and it is the product of Edward S. Clark, who has built steam cars for years and is best known through his connection with motor cars of the steam-driven class. The machine shown, a three-ton express wagon, is with-

stone, excavated material and the like, and the other is a rear-dumping coal wagon with tilting body. Both are alike in that they are exactly similar to horse-drawn wagons that have been in use for years, except that the front wheels are motor-wheels and there is a battery box mounted

worst of the wear and tear, off the rubber tires, and so reduce tire expense. In fact, this type of machine has been worked out especially as a vehicle for short-haul work—work that must be done cheaply. Consequently no attempt has been made to build a fast truck; the average speed under load is about five miles an hour, and the speed without load about seven miles an hour. Current consumption is low, wear and tear is low, tire expense is low and the car can be handled by a low-priced driver.

Instead of the usual volt-ammeter, these trucks are equipped with Sangamo ampere-hour meters. This type of meter has a dial marked off in amperes; the indicating hand stands at 0 when the battery is fully charged, showing that no current has been used since the battery was charged. As soon as the motors are started, the meter commences to register, and the current consumed is at all times shown, so that the driver always knows how much energy is available for use. If the capacity of the battery is 250 ampere hours, the meter will register a consumption of 250 ampere hours when the charge has been exhausted. On the other hand, the indicating needle will commence a movement in the opposite direction when charging is commenced, and when the charge is complete will again stand at 0. As this is the point at which charging should be stopped, an automatic cut-out is arranged to cut off the current at this stage, so that the charging consists

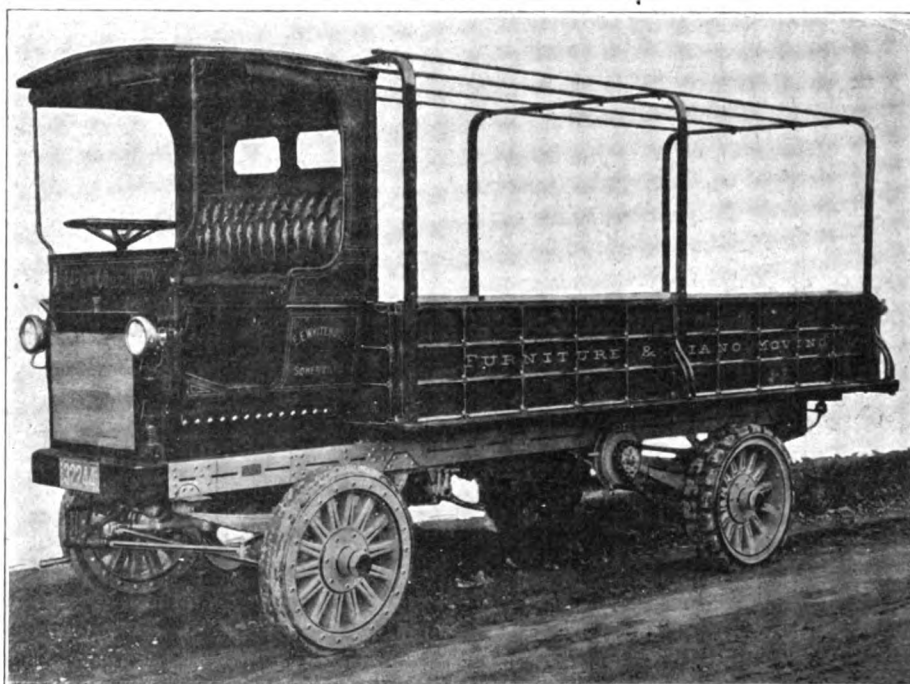


COUPLE-GEAR FRONT WHEEL DRIVE BATTERY TRUCK

out startling features of any kind. Its 35-horsepower motor, with block-cast cylinders, is placed under the driver's seat and footboard, and it is rather noticeable that there is more space around it than would be expected after an exterior view. The drive line is carried through a cone clutch, gearbox giving three speeds, selectively controlled, bevel gears, jackshaft and side chains; Timken axles are used, with roller bearings for wheels and steering knuckles. Steering is effected through a double worm gear that is irreversible; the steering wheel is placed on the left side and the control levers in the center, to be operated by the driver's right hand. The wheelbase is made either 120 inches or 130 inches, according to the type of body required. Front wheels are 36 inches in diameter and the rear wheels 42 inches. The front wheels are shod with single 6-inch tires and the rear wheels with dual 5-inch tires, all solids.

Though Couple-Gear electric trucks have been on the market for a number of years, and have been seen at the Chicago automobile shows, the machines shown at Mechanics' Hall are the first that have been shown in the East. The exhibit is made by W. E. Eldridge, the Boston representative of the Couple-Gear Co., of Grand Rapids, Mich., and consists of two front wheel driven battery trucks, each of five tons capacity. The front or driving wheels are of the type peculiar to Couple-Gear vehicles, each wheel having an electric motor enclosed in it, driving the wheel through internal gearing that gives a reduction of 25 to 1 in a single step. One of the trucks is a bot:om-dumping wagon for carrying

just behind the driver's seat—a departure from the usual practice of hanging the battery under the body. The chief reason for



TEEL-WOODWORTH THREE-TON TRUCK WITH FURNITURE BODY

this arrangement is to get just the right weight on the driving wheels for traction when the machine is running light. When loaded, a very large proportion of the weight is carried on the rear wheels, which are of the regular wagon type with steel tires. The object of this construction is to take the load, and consequently the

of connecting up the plug and turning on the current; the cut-out "does the rest."

The Teel-Woodworth truck is another example of plain, substantial motor car engineering. A chassis is shown, in addition to two cars with bodies. A feature of this machine is the heavy and well braced frame. Like a great many other

modern trucks, the Teel-Woodworth has its motor under the footboard; the engine is a Continental of 30 horsepower, driving through a Hele-Shaw type clutch, Cotta three-speed selectively controlled change gear, jackshaft and side chains. Timken roller bearing axles are employed. All the wheels are 36 inches in diameter and the prevailing practice of using dual tires on the rear wheels and singles on the front wheels is adopted, the rear wheels having 4-inch twin tires and the front wheels single fives. The wheelbase is 128 inches.

Bowman Co., J. W., Boston, Mass.—Two Waverley electric delivery cars and one electric chassis.

Buick Motor Co., Flint, Mich.—Four two-cylinder double-opposed Buick trucks, all of 1-ton capacity, and one four-cylinder combined tender and chemical engine.

Chase Motor Truck Co., Syracuse, N. Y.—Two three-cylinder two-cycle air-cooled Chase trucks of 1 and 1½-ton capacity.

Clark, Edward S., Dorchester, Mass.—One 3-ton Clark truck.

Commerce Motor Car Co., Detroit, Mich.

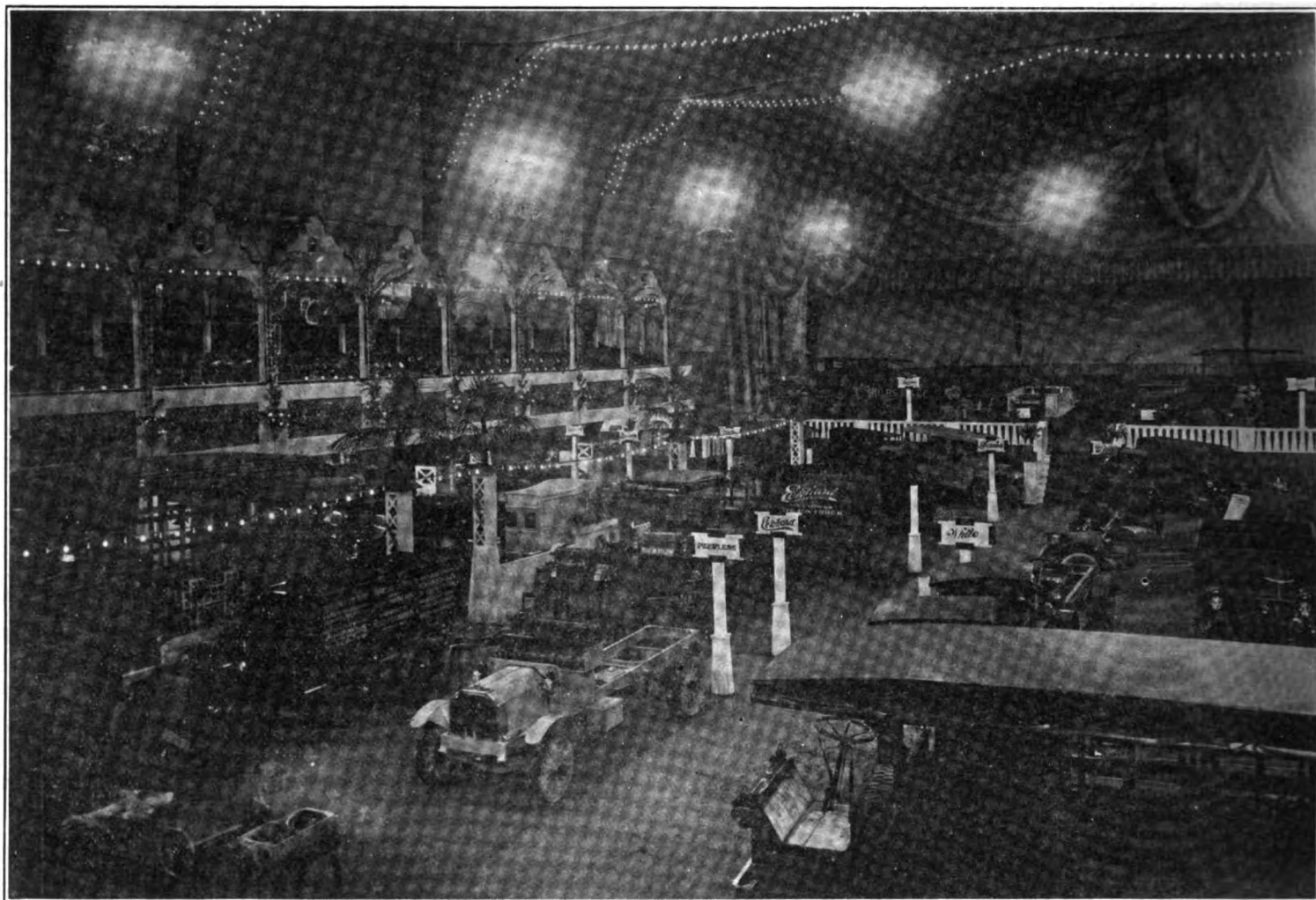
Eldridge, W. E., Boston, Mass.—Two 5-ton front wheel drive Couple-Gear electric trucks.

Ford Motor Co., Boston, Mass.—One Ford panel body delivery wagon.

Fuller, Alvin T., Boston, Mass.—Eleven 3-ton Packard trucks and one 2-ton truck.

General Motors Truck Co., Boston, Mass.

—Two GMC electric trucks, one 4 and one 5-ton and one 3-ton electric chassis. Seven gasoline trucks: one 1-ton, two 2-ton, two 3½-ton, and two 5-ton and one each 2-ton and 3½-ton chassis.



THE TRUCKS IN THE SPANISH MISSION SETTING OF GRAND HALL

The following is the full list of vehicle exhibitors:

American Locomotive Co., Providence, R. I.—Four Alco trucks: one 2-ton and three 3½-ton and one 5-ton chassis.

Atterbury Motor Truck Co., Buffalo, N. Y.—One 1,500-pound Atterbury delivery wagon: four trucks, one each 1-ton, 1½-ton, 2-ton and 3-ton, and one 20-passenger bus.

Autocar Co., Ardmore, Pa.—Six Autocar 1½-ton two-cylinder delivery wagons, one each ambulance and 15-passenger hotel bus, and one each 1,000-pound and 1,500-pound chassis.

Boston Motor Co., Boston, Mass.—One 1-ton Bessemer truck.

—Two four-cylinder friction driven Commerce delivery wagons and one chassis.

Curtis-Hawkins Co., Boston, Mass.—Three Speedwell trucks: one each 2-ton, 4-ton and 6-ton.

Decatur Motor Car Co., Cambridge, Mass.—One 1½-ton Decatur-Hoosier truck and one 1½-ton chassis.

Dodge Motor Vehicle Co., Cambridge, Mass.—One 6½-ton Commer truck and one 6½-ton chassis. Two 3-ton Pope-Hartford trucks and one chemical engine.

Eastern Motor Truck Co., Cambridge, Mass.—Four 1½-ton Kelly air-cooled trucks, four 3-ton and one 4-ton truck.

Eckhard Motor Truck Co., Boston, Mass.—One six-cylinder 5-ton Eckhard truck.

General Vehicle Co., Long Island City.

L. I.—Four General Vehicle electric trucks: one 1-ton, two 2-ton, and one 5-ton and two 2-ton electric chassis.

Grabowsky Power Wagon Co., Detroit, Mich.—One 1-ton Grabowsky truck and one five-cylinder chassis.

Hanson Bros., Boston, Mass.—Two 2-ton Sternberg trucks and one 4-ton chassis.

International Harvester Co. of America, Somerville, Mass.—Three two-cylinder four-cycle air-cooled International delivery wagons: one each ½-ton, ¾-ton and 1-ton capacity.

KisselKar Co., Boston, Mass.—Three Kissel trucks: one each 1-ton, 2-ton and 3-

ton capacity and one 1-ton and one 4-ton chassis.

Lauth-Juergens Motor Car Co., Fremont, Ohio—One 3-ton Lauth-Juergens truck and one 1-ton chassis.

Locomobile Co. of America, Boston, Mass.—One 5-ton Locomobile chassis.

Lozier Motor Co., Boston, Mass.—One 5-ton Lozier chassis.

Mack Motor Truck Co., Boston, Mass.—Nine Mack trucks: one 2-ton, one 5-ton and four 7-ton. Four Saurer trucks: two 4½-ton and two 6-ton.

Smith, R. L. & H. H., Boston, Mass.—Two Mais trucks: one 1½-ton and one 2-ton and one 1½-ton chassis.

Stanley Motor Carriage Co., Newton, Mass.—Two Stanley steam trucks: one 1-ton and one 12-passenger bus.

Stearns Co., F. B., Cleveland, Ohio—One 5-ton Stearns truck.

Stevens, Chas. H., Atlantic City, N. J.—Two 1½-ton Sandusky trucks.

Teel Mfg. Co., Bedford, Mass.—Two 3-ton Teel trucks and one 3-ton chassis.

Underhill Co., Boston, Mass.—Two Knox

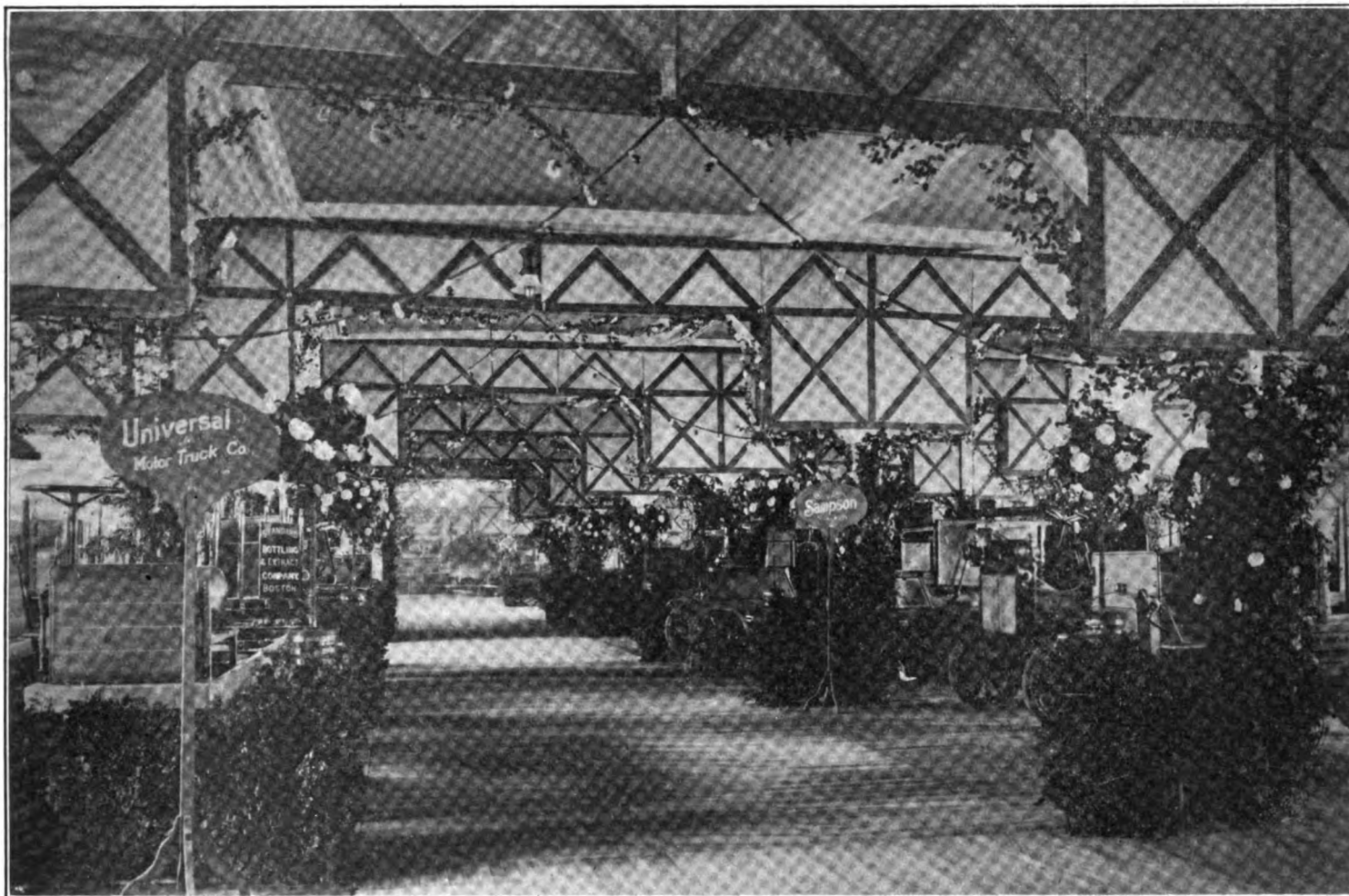
Walker electric delivery cars and one electric chassis.

Wentworth, F. F., Boston, Mass.—Two Garford trucks: one 1½-ton and one 5-ton.

White Co., Boston, Mass.—Eight White trucks: one 1½-ton, one 2-ton, four 3-ton and two 5-ton, and six chassis; four 3-ton, one 5-ton and one 1½-ton.

Whitney-Barney Co., Boston, Mass.—Three Gramm trucks: one each 1-ton, 2-ton and 3-ton.

Whitten-Gilmore Co., Boston, Mass.—One



HOW THE "GARDEN WALK" IN EXHIBITION HALL APPEARED WITH THE TRUCKS IN PLACE

Mercury Mfg. Co., Chicago, Ill.—Three 1,000-pound Mercury delivery wagons.

Morgan Motor Truck Co., Worcester, Mass.—Three Morgan trucks: one each 2-ton, 3-ton and 5-ton.

Peerless Motor Car Co., Boston, Mass.—Three Peerless trucks: one each 3-ton, 4-ton and 5-ton and one 3-ton chassis.

Phelps, Frank N., Boston, Mass.—Two Baker electric 1,000-pound delivery wagon and one 2-ton electric chassis.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Three 5-ton Pierce-Arrow trucks and one 5-ton chassis.

Sonfard-Herbert Co., Syracuse, N. Y.—Two Sanbert trucks: one 1-ton four-cylinder water-cooled and one 1-ton three-cylinder two-cycle air-cooled.

trucks: one 1½-ton and one 3-ton and one 60-horsepower fire engine, one hose cart and chemical engine, one police patrol, one Knox Martin tractor and one 5-ton chassis.

United Motor Boston Co., Boston, Mass.—Two ½-ton two-cylinder double-opposed Sanford trucks, four four-cylinder trucks, two 1½-ton, one 3-ton and one 5-ton and one 5-ton chassis.

Velie Motor Vehicle Co., Boston, Mass.—One 3-ton Velie truck and two chassis: one 3-ton and one 5-ton.

Victor Motor Car Co., Boston, Mass.—Two Victor trucks: one 1½-ton and one 3½-ton.

Walker Vehicle Co., Boston, Mass.—Two

3-ton Dayton truck and one 1½-ton and one 5-ton chassis. Two 1-ton Federal trucks and one 1-ton chassis.

ACCESSORIES AT BOSTON SHOW.

As has been the case in every other show of two weeks' duration, the various accessory rows in Mechanics' Hall show woeful depletion; everywhere great gaps are apparent; almost literally exhibitors went out in droves, only 80 of the 194 who last week displayed their wares electing to stay out the second week. Swelling the depleted list, however, 10 new exhibitors occupy space, and these, together with the holdovers, who in the majority of cases are manufacturers of products of recognized merit and having almost a world-

wide reputation, make up in quality the deficiency in quantity.

It was to be expected that many of the products which have become familiar to motorists by reason of extended use, or previous exploitation at the national shows in New York and Chicago, would be on hand during the continuance of the commercial vehicle show, and there is little likelihood of homesickness for the sight of old standbys, for very few of them have been removed and returned to the comparative quietude of the salesrooms in which they daily are displayed.

Several of the booths of the exhibitors who did not remain over for the commercial car show, are occupied by newcomers. A very comprehensive display of electric motors for commercial vehicle work, battery charging outfits, and other electrical paraphernalia is staged by the Westinghouse Electric & Mfg. Co., of Pittsburgh, Pa., the products of which, although not new in the automobile field by any means, rarely are seen on exhibition. The Baldwin Chain & Mfg. Co. has a very large display, embracing all of its numerous chain products, and also the Brown steering gear. The American Electric Tool Co., of West Newton, Mass., displays automatic electric tools in several different forms, one of which is a buffer which it recommends for motor car polishing.

Two new articles in the way of non-skid chains are on view, both products of Boston firms—the Whittaker truck tire chain, made by the Whittaker Chain Tread Co., which is of conventional design, and the Snimoc Metallic Traction Mat, made by the Snimoc Metallic Traction Mat Co., in the design of which the chains are so fastened as to form a rather coarse chain fabric.

One new carburetter—the Kennedy—cropped out, staged by the designer and maker, J. Kennedy, of Boston. Constancy of the mixture is claimed to be the leading feature of the device, this very desirable virtue being obtained by the use of two jets, two throttle valves linked together and a by-pass through which the gases are forced at low engine speeds. An entire absence of springs, and but two adjustments, are other features claimed for the apparatus.

The complete list of accessory exhibitors is as follows:

- Adams & Co., J. Q., Boston, Mass.—Dictionaries.
- Ajax-Grieb Rubber Co., New York City—Ajax tires.
- American Electric Tool Co., Boston, Mass.—Electric Tools.
- American Storage Battery Co., Cambridge, Mass.—Storage batteries.
- American Technical Society, Boston, Mass.—Publications.
- Ames Auto Jack Truck, Franklin, Pa.—Automobile jacks for garage use.
- Atlas Chain Co., Brooklyn, N. Y.—Non-skid tire chains.
- Auto Time Saver Co., Boston, Mass.—Time Saver tire patches.
- Baldwin Chain & Mfg. Co., Worcester, Mass.—Chains, sprockets and steering gears.
- Bennet, P. S. H., & Co., Boston, Mass.—Regent bench tools.
- Borne-Scrymser Co., Boston, Mass.—Colonial and Silex lubricants.
- Bowser & Co., Inc., S. F., Fort Wayne, Ind.—Oil and gasoline storage apparatus.
- Boyd, F. Shirley, Boston, Mass.—R. I. V. ball bearings.
- Bucklin & Co., Walter S., Boston, Mass.—Insurance.
- Chandler & Farquhar Co., Boston, Mass.—Machinery tools and machinists' supplies.
- Clayton Air Compressor Works, Boston, Mass.—Garage and portable tire pumps.
- Coes Wrench Co., Worcester, Mass.—Wrenches.
- Coward Auto Supply Co., Boston, Mass.—Star speedometers, J-M shock absorbers and other supplies.
- Cramp & Sons Ship and Engine Building Co., Wm., Philadelphia, Pa.—Bronze and bearing metals.
- Crane & Co., L. M., Boston, Mass.—Eureka lubricants and soaps.
- Dean Electric Co., Elyria, O.—Tuto horns and Dynalux lighting systems.
- Deane Steam Pump Co., Holyoke, Mass.—Steam pumps.
- Davies Mfg. Co., Detroit, Mich.—Comfort spring tires.
- Diamond Rubber Co., Akron, O.—Diamond tires.
- Eagle Oil and Supply Co., Boston, Mass.—Eagleine lubricants.
- Edison Storage Battery Co., West Orange, N. J.—Storage batteries.
- Eisner & Co., H., Boston, Mass.—Eisemann magneto.
- Electric Storage Battery Co., Philadelphia, Pa.—Storage batteries.
- Empire Tire Co., Trenton, N. J.—Empire tires.
- Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.
- Firestone Tire and Rubber Co., Akron, O.—Firestone tires.
- Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.
- Goodrich Co., B. F., Akron, Ohio—Goodrich tires.
- Goodyear Tire and Rubber Co., Akron, O.—Goodyear tires.
- Gray & Davis, Amesbury, Mass.—Lamps and electric lighting systems.
- Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford auto-jacks and engine starters.
- Harris Oil Co., A. W., Providence, R. I.—Lubricants.
- Hoffecker Co., Boston, Mass.—Speedometers.
- Holtzer-Cabot Electric Co., Brookline, Mass.—Lighting systems, and Newcomb carburetters.
- International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.
- Johnson Steel Wheels Corp., Boston, Mass.—Steel truck wheels.
- Jones Speedometer, New Rochelle, N. Y.—Speedometers and odometers.
- Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.
- Keystone Lubricating Co., Philadelphia, Pa.—Keystone lubricants.
- Kennedy, J. S., Boston, Mass.—Kennedy carburetter.
- Knight, Margaret E., Framingham, Mass.—K-D motor.
- Lee Tire and Rubber Co., Conshohocken, Pa.—Tires.
- Leland & Co., W. H., Worcester, Mass.—Machinery.
- Lunt, Moss Co., Boston, Mass.—Stationary pumping and lighting plants.
- Marburg Bros., Inc., New York City—Mea magnetos.
- Millbury Steel Foundry Co., Millbury, Mass.—Castings.
- Moore, Smith Co., Boston, Mass.—Fur garments.
- Mosler & Co., A. R., New York City—Spit-Fire spark plugs.
- Motor World Publishing Co., New York City—The Motor World.
- Motz Tire and Rubber Co., Akron, Ohio—Motz tires.
- National Carbon Co., Cleveland, Ohio—Dry cells.
- New York and New Jersey Lubricants Co., New York City—Columbia lubricants.
- Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania and Polack tires.
- Philadelphia Storage Battery Co., Philadelphia, Pa.—Storage batteries.
- Pyrene Co. of New England, Boston, Mass.—Fire extinguishers.
- Raymond Engineering Co., Inc., Boston, Mass.—R. V. motors.
- Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting devices.
- Robinson & Son Co., Wm. C., Baltimore, Md.—Lubricants.
- Russell & Co., T. F., Boston, Mass.—Leavett timers, Minerva horns, Victor lamps. Q. D. tire tools, etc.
- Sages Truck Co., Boston, Mass.—Trunks.
- Sawyer Oil Co., Howard B., Boston, Mass.—Lubricants.
- Sewell Cushion Wheel Co., Detroit, Mich.—Resilient wheels.
- Sheldon Axle Co., Wilkes-Barre, Pa.—Sheldon axles.
- Splittorf, C. F., New York City—Magnetos and spark plugs.
- Standard Auto Supply Co., Boston, Mass.—Rhineland, R. B. F. and Fafner bearings, Shaler and Imperial vulcanizers, Hoffecker speedometers, Standard lighting systems, and Deaco dynamos.
- Standard Oil Co. of New York, New York City—Lubricants.
- Standard Roller Bearing Co., Philadelphia, Pa.—Standard roller bearings.
- Standard Woven Fabric Co., Worcester, Mass.—Multibestos brake lining.
- Steel Cushion Tire Co., New York City—Spring wheel.
- Stewart & Clark Mfg. Co., Boston, Mass.—Stewart speedometers.

Swinehart Tire and Rubber Co., Akron, O.—Swinehart tires.
 Texas Co., New York City—Lubricants.
 Underhay Oil Co., Boston, Mass.—Oils and lubricants.
 United Rim Co., Akron, Ohio—Demountable rims.
 U. S. Light & Heating Co., New York City—Storage batteries.
 U. S. Tire Co., New York City—Hartford, G & J, Morgan & Wright, Continental and United States tires.
 Vacuum Oil Co., Boston, Mass.—Lubricants.
 Veeder Mfg. Co., Hartford, Conn.—Speedometers, odometers, die castings, etc.
 Walpole Rubber Co., Walpole, Mass.—Valveless inner tubes and rubber products.
 Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.—Motors, controllers and charging apparatus.
 Whitaker Chain Tread Co., Boston, Mass.—Anti-Skid chains.
 White & Bagley Co., Worcester, Mass.—Oilzurn lubricants.
 Whitney Mfg. Co., Hartford, Conn.—Whitney chains.
 Worth-Wedge Steel Specialties Co., Boston, Mass.—Lock washers.

Four Fined for Poorly Lighted Plates.

Holding that the majority of number plates displayed on the rear of automobiles running in New York City are not visible enough to comply with the requirements of the Callan law, Magistrate Herbert has inaugurated a sort of crusade against offenders. One day last week four chauffeurs were brought before him in quick succession, and in each case the magistrate imposed a fine. Before inflicting the punishment the magistrate declared that usually the lamp was too close to the number and that a person on the same side as the lamp is able to see only the last three numerals. He stated that in his opinion the lamp should be from six inches to a foot away from the number, so that a clear view of the entire number can be had from any angle.

Savannah Club Drops Two Big Races.

Following intimations given out immediately after the races on Thanksgiving Day last, the Savannah Automobile Club, at its last meeting on Friday, 8th inst., formally let it be known that it will not take the initiative to stage the Vanderbilt and Grand Prize races on the Savannah course this fall. Whether anyone else in Savannah will do so is extremely doubtful.

Bayse's Bullet Punctures Both His Legs.

After winning the Bakersfield (Cal.) road race last month, Jack Bayse, the Stutz pilot, suffered an unusual accident. While shifting an automatic pistol which he carried, from one pocket to another, he dropped the weapon on the sidewalk, and the cartridge exploding sent a bullet through both his legs. He was removed to the San Joaquin hospital.

SYRACUSE SHOW IN TWO BUILDINGS

They Both Are Attractively Adorned and There is Much to See—Unusual Electric Sign an Outdoor Feature.

If the attendance on the opening night is any criterion, the good people of Syracuse surely do love their automobile show, which is advertised by means of a huge electric sign picturing an automobile party, and the rapidly revolving wheels and the persistent fluttering of milady's frills and foibles add a touch of realism which apparently is enough to draw the most conservative to the fourth annual show of the Syracuse Automobile Dealers' Association, which is being staged in the State Armory and the Alhambra Auditorium. It was opened Tuesday night, 12th inst., and will continue until Saturday night next.

No new makes of vehicles, or ones not heretofore exhibited cropped out among the 55 machines bearing different nameplates which are staged by the 35 exhibitors; the one home product in the motor vehicle line, the Moyer, is of course very much in evidence. Accessories are shown by 18 dealers.

The number and size of the exhibits make it necessary for the show to be staged in two buildings, a feature which gave the decorator ample opportunity to double up on his supply of ingenuity and produce two attractive settings. The New York State Armory, which houses the major portion of the pleasure vehicle exhibits, all of the commercial car exhibits and "accessory row," presents a pleasing appearance. The decorative scheme, though embracing more or less conventional features, such as a blue canopy ceiling covering, booths of lattice work, entwined with smilax, and festoons of electrics to supply the illumination, is carried out with greater decorative ability than is usual, and includes several novel and distinctive features, such as individual electric signs indicating the names of the cars displayed, numerous panels executed in oil, and a "sure enough" mascot in the person of an Iroquois chief, who patrols the exhibition floor arrayed in Indian costume, war paint, feathers and all. Entertainment is furnished by Conning's Band, located in the drill hall, while the accessory and commercial car exhibitors who display their products in the basement, are entertained by Binning's orchestra. In the Alhambra Auditorium, where the second section of the pleasure vehicle show is housed, the same decorative scheme is adhered to with an added feature in the form of a woodland stage setting made more realistic by numerous canaries contained in rustic cages. Music is furnished by Pollock's orchestra.

The exhibitors of pleasure cars are: H. A.

Moyer, Moyer; Kerr-Doane Motor Co., Amplex, Everitt and Velie; C. Arthur Benjamin, Packard, E-M-F and Flanders; F. P. Anderson, Hupmobile and Alco; Overland Syracuse Co., Overland and Garford; T. A. Young, Peerless and R. C. H.; A. M. Zimbrich, Stoddard-Dayton; United Motor Syracuse Co., Maxwell and Columbia; J. H. Valentine Co., Chalmers, Paige-Detroit and Brush; W. R. Shaw, Rambler and Reo; W. King Smith Co., Stearns and Moon; Willis Motor Car Co., Oldsmobile and Oakland; Syracuse Motor Car Co., Ford; Genesee Motor Car Co., Cadillac; H. H. Franklin Mfg. Co., Franklin; Buick-Keating Garage. Buick; J. L. Youman, Mitchell; James Auto Co., Stevens-Duryea; A. A. Lederman Co., Pierce-Arrow; National Motor Sales Co., National; Hazard & Ryon, Michigan; L. H. Leonard, Krit; J. I. Case Threshing Machine Co., Case; American-Cole Sales Co., American and Cole; Abbott-Detroit Sales Co., Abbott-Detroit; Souter & Tuttle, Jackson; H. B. Conkling, Elmore; W. F. Horton, Marathon and Bergdoll; Wightman & Rich Co., Winton; Acme Garage, Pullman; Brighton Garage, Detroit; Sabine Auto Co., Cutting; Syracuse Regal Co., Regal.

Commercial vehicles are exhibited by: C. Arthur Benjamin, Packard; Sanford-Herbert Co., Sanbert; Buick-Keating Co., Buick; Syracuse Motor Car Co., Ford; Genesee Motor Car Co., Mack; F. P. Anderson, Alco; Chase Motor Truck Co., Chase; W. E. Hookway Motor Truck Co., Reliance; Overland-Syracuse Co., Overland.

The accessory exhibitors are: Syracuse Rubber Co., rubber goods and sundries; Loggie Bros., Miller tires; Standard Oil Co., lubricants; F. H. Aubeuf, headlight brackets and dimmers; Wayne Oil Tank and Pump Co., oil and gasoline storage apparatus; Hoyt & White, tops and seat covers; J. H. Valentine Co., Hanna engine starters; E. Q. Williams, ignition apparatus; Syracuse Auto Supply Co., supplies; Ignition Starter Co., Disco engine starters; Jones & Pimm, tops and seat covers; Olmstead & Co., Indian motorcycles; Potter Co., Harley-Davidson motorcycles; A. H. McGraw, Thor and Excelsior motorcycles and supplies.

Where Motor Buses Hurt Trolley Cars.

Just how much London's immense fleet of motor buses "cuts into" the profits of the Metropolitan Electric Tramways Co., which operates what in American parlance are known as trolley cars, is revealed in a recent application to the London Board of Trade to permit the operation of the "trams" at a speed of 16 miles an hour instead of 12 miles an hour, which is the present limit for both "trams" and buses. The Tramways company declares that it cannot successfully compete with the buses unless the speed limit for its cars is raised four miles an hour to give its "trams" that much advantage over the buses.

TRUCK THAT EMPLOYS DISTILLATES

It's a California Production and Patented Gasifier Takes Care of Unusual Fuels—Other Features of Vehicle.

As if the distinction of being the first motor truck to be seriously manufactured on the Pacific Coast were not a sufficient honor, the machine built by the Moreland Motor Truck Co., of Los Angeles, is further notable because it is designed and built expressly with a view to the use of distillate for fuel, instead of gasoline, in its four-cylinder motor. This fuel is vaporized by the use of the Moreland patent gasifier, in connection with a float feed carburetter, and the difference between the cost of distillate and that of gasoline is

3-ton motor measures $4\frac{1}{2} \times 5\frac{1}{2}$, and is rated at 32 horsepower, and the 5-ton motor, with cylinders $5\frac{1}{4} \times 7$ inches, is rated at 44 horsepower. It will be noted that in all cases the stroke is long as compared with the bore. The motors are designed to run at low speeds and are operated under governors.

In the two smaller machines the cylinders are of the L-head type, with valves on the left side; on the 5-ton model the T-head is adopted. All valve operating mechanism is enclosed, for the double purpose of minimizing mechanical noise and excluding dust and grit. In all three machines the cooling water is circulated by gear-driven centrifugal pumps, the radiators being of the vertical flat tube type and mounted on spiral springs to avoid the racking due to vibration. The cooling systems of the three machines carry 8, 12 and 16 gallons of water, respectively. Ignition is by Bosch

framing, the depth being 5, 6 and 7 inches in the three trucks, respectively. Cross members are of the same material and the corners are well braced with gusset plates: all holes are drilled, not punched, and rivets put in hot. Semi-elliptic springs are used all round, in the rear there is an extra semi-elliptic spring, inverted, carried by a cross member and coming just over the rear axle and parallel with it. When the truck is running light this spring is clear of the axle, but when loaded the ends are brought down until they rest on plates carried by the axle, well out toward the ends. Both front and rear axles are of heat-treated vanadium steel; the front axle is of I-beam section and the rear axle rectangular.

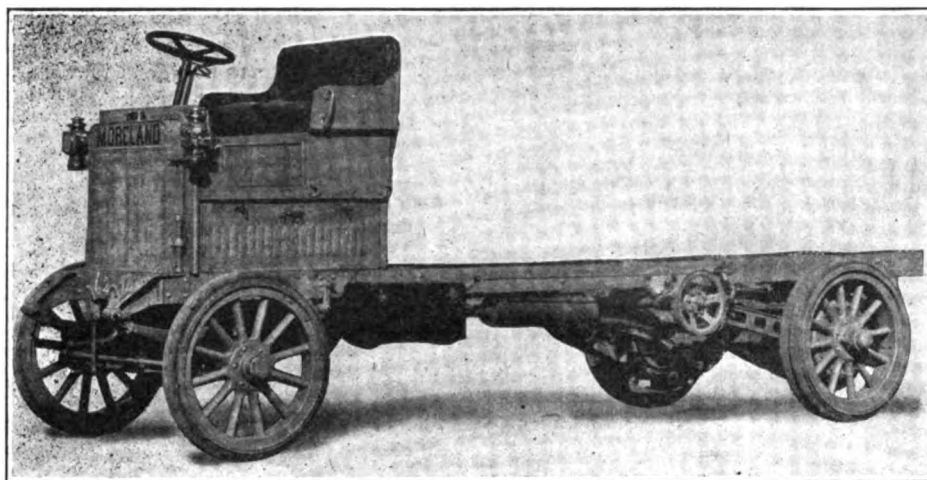
The wheels in the $1\frac{1}{2}$ -ton truck are 34 inches in diameter all round, with 4-inch single tires in front and 3-inch duals in the rear. In the 3-ton car all wheels are 36 inches in diameter, with 5-inch single tires in front and 4-inch duals in the rear. In the 5-ton car the rear wheels are quite large, being 40 inches in diameter, while the front wheels are 36 inches; tires are 6-inch singles in front and 5-inch duals in the rear. Solid tires are used on all machines.

Each chassis is built in different wheel-base lengths to suit different service conditions, and the loading spaces also vary, so that there is no difficulty in making the truck fit the job. In all cases the tread of the rear wheels is greater than that of the front wheels, the figures being 58 and 64 inches for the $1\frac{1}{2}$ -ton truck, 62 and 68 inches for the 3-ton truck and 60 and 74 inches for the 5-ton truck.

The equipment consists of seat cushions, combined odometer and speedometer, two oil headlights, oil tail light, horn, complete set of tools in a special tool box.

Sparks That Show Quality of Metals.

Methods of testing different varieties of iron and steel to ascertain their composition are numerous enough, though it is doubtful if any is more peculiar than one which recently was discovered through experiments conducted at Budapest. It was found that the incandescent particles thrown off from iron and steel when held against an emery wheel afford a practical means of determining their elements. Carbon steels, manganese steel and steels containing tungsten and nickel each give a characteristic spark, of different forms and colors, which are easily distinguishable. The form of the spark picture changes with the amount of carbon. Even so slight a difference as 0.01 per cent. of carbon, it is said, can be detected in this way. Pointed, branching lines denote carbon steel; tool steels show the appearance of a "blossom" on the branches; tungsten steel gives red, streaked rays and shining points, with little balls thrown out of the formation, and an explosion appearance in the rays denotes the presence of molybdenum or vanadium.



MORELAND FIVE-TON "DISTILLATE" TRUCK—A CALIFORNIA PRODUCT

such that no little economy results from the use of the cheaper hydrocarbon—60 per cent., according to the figures of the Moreland company. This feature of the new truck is one that is not to be despised in these days of rising gasoline prices and sharp competition.

Apart from the special devices incorporated in the machine to enable the motor to run on distillate, the Moreland truck is built along lines that may be termed standard for machines of this class, though here and there are found details that are not altogether common in motor truck construction. For instance, the motor has its four cylinders cast en bloc, which is a practice much less common in commercial vehicles than in pleasure cars.

Moreland trucks are built in three models— $1\frac{1}{2}$ tons, 3 tons and 5 tons carrying capacity, respectively—the design and constructional features being practically the same in all three, the dimensions, of course, varying in accordance with the requirements. Each size of chassis has its special motor. The $1\frac{1}{2}$ -ton machine has a 27-horsepower motor, with cylinders of $4\frac{1}{4}$ inches bore and $5\frac{1}{4}$ inches stroke; the

dual system, with high tension magneto and battery of dry cells for the alternative source of current. Lubrication is effected by a combination of force feed, with mechanically operated pumps, and constant level splash in the crank case. The fuel tank in the 5-ton truck has a capacity of 25 gallons; in the two smaller machines the tanks hold 22 gallons each.

Power is transmitted through a leather-faced cone clutch and propeller shaft, with a universal joint at each end, to the gear box, and thence to a jackshaft and side chains, to the rear wheels. The gear box is bolted to the casing which encloses the bevel gears and differential, and the jackshaft outboard bearings are carried in the ends of the casing arms, the casing being similar to the rear axle type. The gears are selectively operated; the 5-ton truck has four forward speeds and the other two machines three speeds each. Timken roller bearings are used throughout the gear boxes. There are brakes on the jackshaft operated by pedal, and emergency brakes on the rear wheels controlled through the customary hand lever.

Alloy steel channel stock is used for the

LIGHTING LAMPS BY THE MAGNETO

New Foster Device Excels in Simplicity and Cheapness—May be Attached and Adjusted by Anyone.

While it doubtless is true that the inherent laziness of man has had something to do with the development of the automatic lighter for acetylene lamps on motor cars, there really are better reasons for its existence. It is not mere laziness that makes a man dislike to splash out in front of his car in the mud to light the lamps; it is not indolence that makes him averse to undertaking the task of lighting up in the

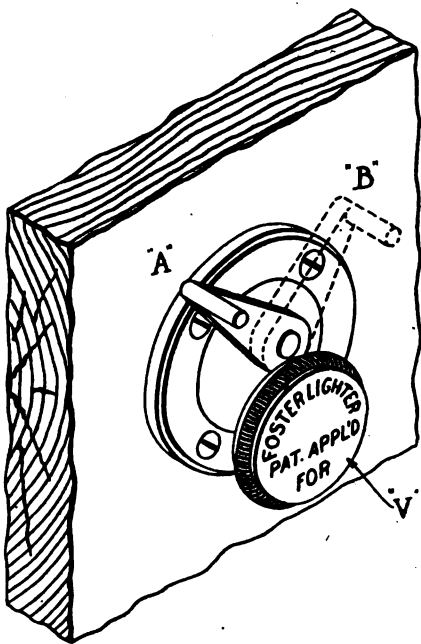


FIG. 1—DASH VALVE AND SWITCH

pouring rain, or in a rollicking wind that blows out the match just before it can ignite the gas, or in weather that benumbs his bare hands; and it is not slothfulness that leads him to go without matches and run the risk of being arrested for running without lights after sundown. On the contrary, the automatic lighter, like the motor starter, comes very near to being a necessity, and doubtless will be so considered after its novelty has worn off. The simpler and cheaper such a device can be made the nearer it will come to entering the class of necessities of motoring, and this is the idea that the makers of the Foster self-lighter, made by the Foster Devices Co., of 146 West 56th street, New York, have had in working out their outfit, which now is ready for marketing, and for which they claim maximum simplicity and minimum cost.

The Foster lamp lighting system consists of spark gaps attached to the lamp burners, a gas valve and switch combined, attached to the dashboard of the car, a pressure-reducing valve controlling the flow of gas

from the tank, and the necessary wiring, terminals and piping, the whole outfit being so compact that it packs in a box measuring $6\frac{1}{2} \times 5 \times 3\frac{1}{2}$ inches. All wiring is cut to the proper length, terminals are permanently attached, piping is cut to length and all parts are tagged so that with the help of the minute directions supplied it is a very simple matter, the makers claim, to install the lighter in any car. The spark gaps are made so that they will fit any acetylene burner, regardless of size or shape.

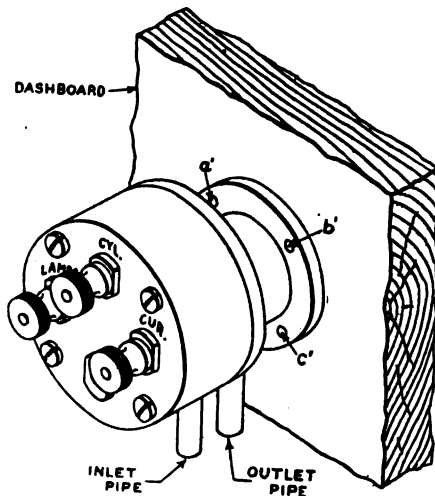


FIG. 2—VALVE AND CONNECTIONS

The dashboard control is shown in Fig. 1, V being the knob of a valve which controls the gas, while the switch handle is above it. A is the "on" position of the switch and B is the "off" position, in which it is normally held by a spring. The part of the control to which connections are made is on the opposite side of the dash, under the hood, and is shown in Fig. 2. The two parts are connected by a neck which passes through a one-inch hole in the dash. Fig. 3 shows a burner with spark gap attached. The terminals E E are carried in a fiber block which has a clip for attaching it to the burner and a little bolt and knurled nut to hold it in place. Two wires pass through ventilating holes in the bottom of the lamp; the ends of the wires are fitted with special terminals. The pressure reducing valve is attached to the acetylene tank, the line pipe being disconnected from the tank, the reducer screwed on the same fitting and the gas pipe attached to the reducing valve instead of the tank.

In setting up the outfit the controller is attached to the dashboard, the gas line pipe is cut just forward of the dashboard, and the pipe leading to the tank connected to the nipple marked "inlet" (Fig. 2), while the pipe leading to the lamps is connected to the nipple marked "outlet," suitable tubing being supplied, cut to length and labeled. Thus the gas is forced to pass through the dashboard control valve before going to the lamps. There are three bind-

ing posts on the switch, marked "lamps," "cyl." and "cur." A wire is run from the "lamps" terminal to one of the wires of the spark gap of the nearest lamp; the other spark gap wire is connected to one of the spark gap wires of the opposite lamp, while the remaining spark gap wire is grounded on the lamp itself, or any convenient part of the bracket or frame. The magneto wire leading to the spark plug of the rear cylinder is disconnected from the plug and attached instead to the post marked "cur." and another wire is carried to the plug from the terminal "cyl." This completes the installation. The gas is turned on at the tank, and left so permanently. The reducing valve, which is made by the Bullard Mfg. Co., Springfield, Mass., cuts down the pressure to four ounces to

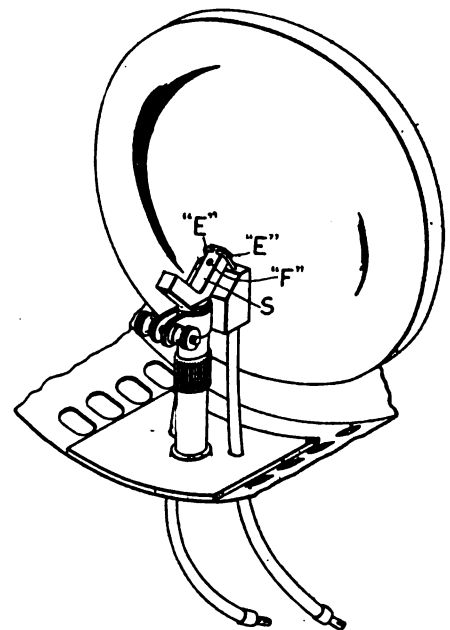


FIG. 3—BURNER ARRANGEMENT

the square inch and does not permit a greater pressure at any time, so that the dashboard regulator valve is all that is needed.

To light the lamps, the valve knob on the dash is turned to the left, which permits the gas to flow to the lamps, and the switch handle is pushed to the left, which has the effect of "stealing" a few sparks from the rear cylinder of the engine and passing them through the lamp spark gaps, instantly lighting the gas as it issues from the burner holes. The effect on the motor is to make the rear cylinder miss firing once or twice when the switch is turned. This wiring is adopted when the car has magneto ignition only. If it is desired to light the lamps when the engine is not running, a battery and coil can be used; but the makers prefer the method described as being far the simpler and more inexpensive, and they make the point that the lamps usually are not lighted unless the car is on the road, and the car, of course, has its motor running then. However, there is no difficulty in using the battery and coil

system with the Foster outfit, if preferred.

There are no joints to be made in the wiring, all connections having special couplings attached. The entire system is insulated to withstand the voltage necessary to produce a spark three-eighths of an inch long. The lamps cannot flare or smoke because the reducing valve keeps the pressure high or low, according to the desire of the manipulator, and at such a point that when the dashboard valve is wide open the lamps are turned full on, but there is not enough gas to make them burn any higher. The reducing valve can be adjusted, if necessary, when installing it, so that the lamps will burn just right with the valve open.

Tire With Originally Treated Fabric.

After several years of experiment, during which time a new tire making machine and a new method of construction were perfected, the Mechanical Rubber Tire Co., of 354 Cumberland street, Brooklyn, N. Y., has placed on the market its first product, which is styled the Giant tire. The company is not a new one; it was incorporated with \$150,000 about a year ago and since then has been quietly perfecting its machinery and organization. It was only recently, however, that manufacturing was taken up in earnest, and, though the output at present is small, arrangements are being made whereby it will be increased considerably in the near future. Robert Rowley, the inventor of the machine on which the tires are made, is president of the company and associated with him are William T. Wheeler, formerly of the Trinity Engineering Co., who is secretary, and F. H. Newcomb, who is treasurer. These men, together with J. Coomber, who invented the tire, form the board of directors. The tire itself differs from others in that the fabric is wrapped under uniform tensions, transversely and reversely. Owing to the peculiar method of wrapping, it is not necessary to cut the fabric on the bias in order to obtain uniform tension, which feature, it is claimed, eliminates the disadvantages of older methods. Another of the interesting points is that instead of the surplus fabric being cut off at the bead, it is turned and wrapped back to give added strength to the side walls. The fabric used is a special weave, and the whole tire—tread and side walls—is wrapped from bead to bead, which construction, it is explained, is possible only with the patented machine which is used.

Lead That Prevents Tools from Rolling.

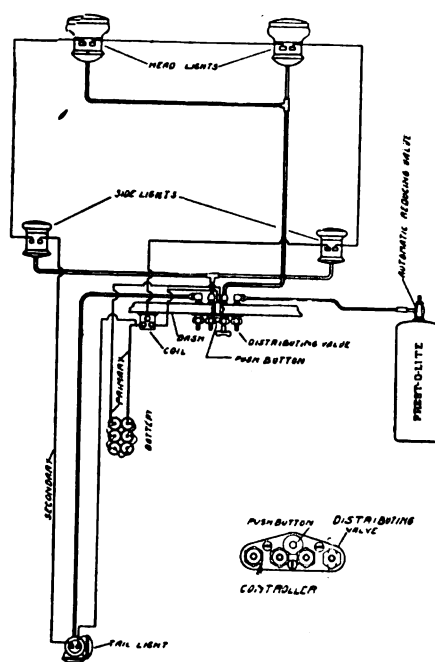
Of the several and various besetting sins to which tools of every day use are subject, probably the most exasperating is the rolling of a screw driver, bradawl or similar tool the moment it is placed on a surface not exactly level. This rather aggravating fault is readily corrected by boring a half-inch hold half way through the handle of the tool and filling it full of lead.

THE MOTOR WORLD

DETAILS OF THE PREST-O-LITER

Indianapolis Company's New Lighting Outfit—How Gas Pressure is Reduced to Maximum of Two Ounces.

Supplementing preliminary details of the latest product of the Prest-O-Lite Co., of Indianapolis, the Prest-O-Lite, which were given four weeks ago in the Motor World, additional particulars now are available and serve to indicate the simplicity of the system and the thoroughness with which the problem of providing that all the lights of a car may be lighted from the driver's seat has been attacked. The heart of the system, so to speak, is a Prest-O-Lite tank,



PREST-O-LITE SYSTEM IN PLAN

and as the accompanying illustration shows, the gas is piped to an ingeniously arranged bank of tiny valves located on the dash of the car. Before reaching the valves, however, the gas first is passed through a patented pressure reducing valve which is really one of the most important parts of the system, inasmuch as it controls the pressure of the gas in the pipe line and insures a maximum pressure of but two ounces regardless of the amount the tank valve is opened. The result achieved is that the tank valve may be opened when a fresh tank of gas is purchased and need not be touched again until the tank is exhausted, the low pressure in the pipe line necessitating only ordinary joints and obviating the possibility of leakage. The system is supplied in three forms, though in each of them the principle and the arrangement of the component parts is the same. Two of the forms are merely amplifications of the first, which includes equipment for lighting only the head lamps; it is designated "Style 1."

"Style 2" is the same except that the tail lamp also may be lighted, and "Style 3," which is illustrated herewith, includes equipment for lighting all the lights from the seat. One of the four small valves used with the last system controls the gas to the other three valves, which in turn control the supply of gas to the side lamps, the head lamps and the tail lamp, respectively. The rest of the system includes a push button, mounted with the valves on the dash plate, a miniature spark coil and suitably wired gas burners. Either pair of lamps, or the tail lamp, or all the lamps at once may be lighted by merely opening the proper valves and touching the button. Current drawn from six dry cells is passed through the coil and delivered to the burners, which are insulated and have their sparking points in such a position that the heat of the acetylene flame cannot harm them. In operation, the system is positive and its application does not require the services of a man of more than ordinary mechanical ability.

Repair That Kept Clutch from Slipping.

"I made a rather neat clutch repair the other day," remarked a motorist who is prone to do his own tinkering, "or rather it was an adjustment, and though it was only supposed to be temporary it has held ever since and I can't see any reason for making a change. The clutch is of the leather-faced cone variety and though the car is almost brand new I commenced to have clutch trouble almost from the first; the trouble was slipping. I put it down to a new clutch leather that had not 'worked in,' and though some fuller's earth helped matters a little the trouble soon manifested itself again. Then I commenced to think the slot in the floorboard was not long enough, so that the clutch was held partly out of engagement, but investigation proved otherwise. Next in the order of things I obtained some tin, a pair of shears and a light hammer. With the hammer I drove pieces of tin in all around between the leather and the clutch face; they've been there ever since and the clutch does not slip in the least. When I got home, though, I investigated the trouble and found that the bolts securing the flywheel had been left rather long so that when the leather 'settled,' so to speak, these bolts prevented the metal boss of the clutch from sliding in far enough to allow the clutch to engage. Later I reversed the bolts but the tin is still between the leather and the clutch face."

To Repair Broken Valve Springs.

Better than the usual method of temporarily repairing a broken valve spring by inserting a washer between the broken ends is simply to turn both broken parts end for end in their places. This will bring the finished ends of the spring together and generally the repair may be relied upon to hold for a short distance, or until a garage is reached.

BRAKE EQUALIZATION; THE PRINCIPLES INVOLVED

Uneven Distribution of Braking Strains That Conduces to Side-slip, Skidding and Excessive Tire Wear
— The Necessity for Positive Equalization and Some of the Modern Methods in Vogue by Which the Desired Ends are Attained.

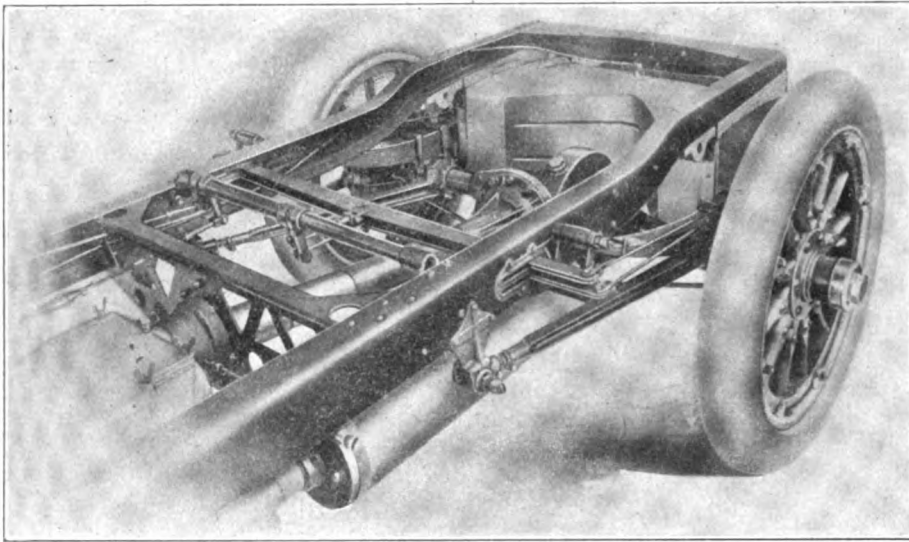
If there is any one thing that has been more persistently "hammered home" than another, it is that "the brakes of a car are its most important parts." But though the

external force in the case of an automobile is obtained by means of the brakes. Similarly, according to another mechanical law, which in all probability is quite as well

have is entirely dependent upon how tightly the tires are pressed against the road by the weight of the car. The friction between two rubbing surfaces always has a constant ratio to the force pressing them together, and the value of this coefficient of friction between rubber and dry macadamized road, according to the investigations of an eminent engineer, is .625. Which, reduced to simpler language, means that if a car weighs exactly 1,000 pounds it would require a pull of 625 pounds to move it over the road with the wheels locked.

Hence, if it requires a pull of 625 pounds to move the car, it follows that there must be applied the equal of 625 pounds pull in order to lock the wheels. But, as has been pointed out, for the reason that the greatest possible braking strain is obtained at the instant before the wheels become locked, for when they are locked the coefficient of friction drops very rapidly, it is desirable to apply a force equal to a little less than is necessary to cause the wheels to slip.

Though it has been suggested that such

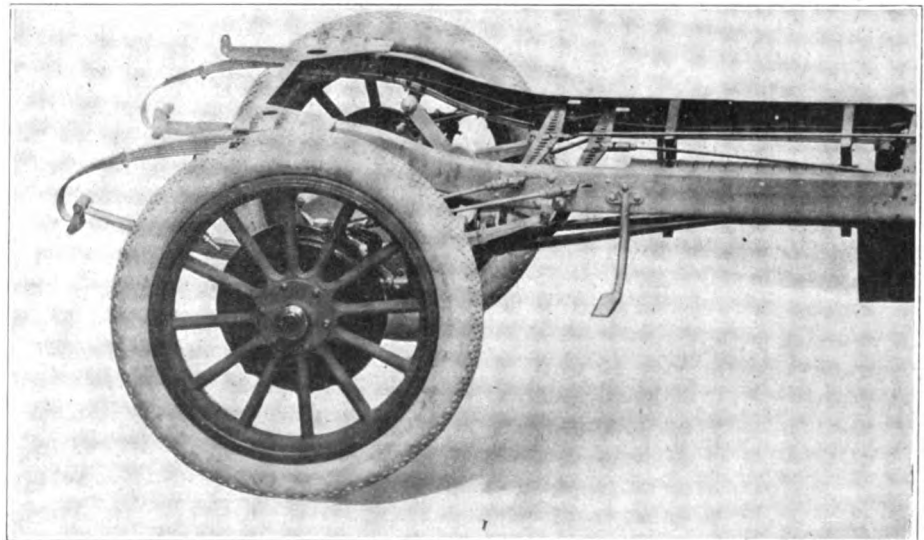


LONG EQUALIZER BARS AS USED ON LOZIER CARS

statement really is an aphorism, not merely because of constant reiteration, there are few to whom the methods of designers to make their brakes live up to their reputation as "the most important parts" are plain. And in this respect the "how" is quite as important as the "why" and the "wherefore," if for no other reason than that it represents the visible connecting link between theory and practice.

Nearly always theory comes first, though there have been not a few cases where inventors have evolved beautiful mechanisms by rule of thumb and subsequently attached to them equally beautiful, if unrecyclable, theories. In the main, however, the modern automobile engineer first evolves his theory; afterward, it is put in practice, and of the hundred and one, or, rather, thousand and one, theories and principles on which an automobile is built there are few that are, or can be made, of greater interest to the purely lay mind than those involved in solving the problem of obtaining efficient, properly proportioned brakes, and above all equally distributed braking strains.

Of course, everybody knows why brakes are necessary, for Newton tells in his first law of motion that "a body will persevere in its state of rest or of motion unless acted upon by some external force." The



SOMEWHAT SIMILAR ARRANGEMENT OF EQUALIZERS—THE PIERCE-ARROW

known, the greatest possible braking strain is obtained, not when the wheels are locked, but at the instant before the wheels actually begin to slide over the road.

In other words, the real point of efficiency of brake application is not between the brake bands and the drums, but between the tires and the road surface, so that, no matter if the wheels be locked by the brakes, the retarding effect they will

a result be achieved by the simple expedient of placing springs in the brake actuating mechanism so that a strain greater than a certain predetermined limit cannot be obtained, such methods have been tried and found wanting. At the best they are but a useless complication, and not the least of their faults is that they are likely to cause chattering. A better way, and one which now is followed by the majority

of manufacturers whose products rank among the top-notchers, is to so proportion the amount of braking surface and the leverage obtainable that the wheels can only be locked as a last resort and by applying very great pressure to the pedal or the lever as the case may be. It is needless to point out that aside from reducing the actual braking effort obtainable, the locking of the wheels also causes excessive tire wear and is one of the most prolific causes of side-slip and skidding.

Obviously, it is not easy accurately to figure the exact braking surface and the best leverage for the best all-around results. There always remains the factor of differing coefficients of friction due to the varying road surfaces traversed. Wet roads make for a lower coefficient of friction, and there is the factor of the materials used in the rubbing surfaces of the

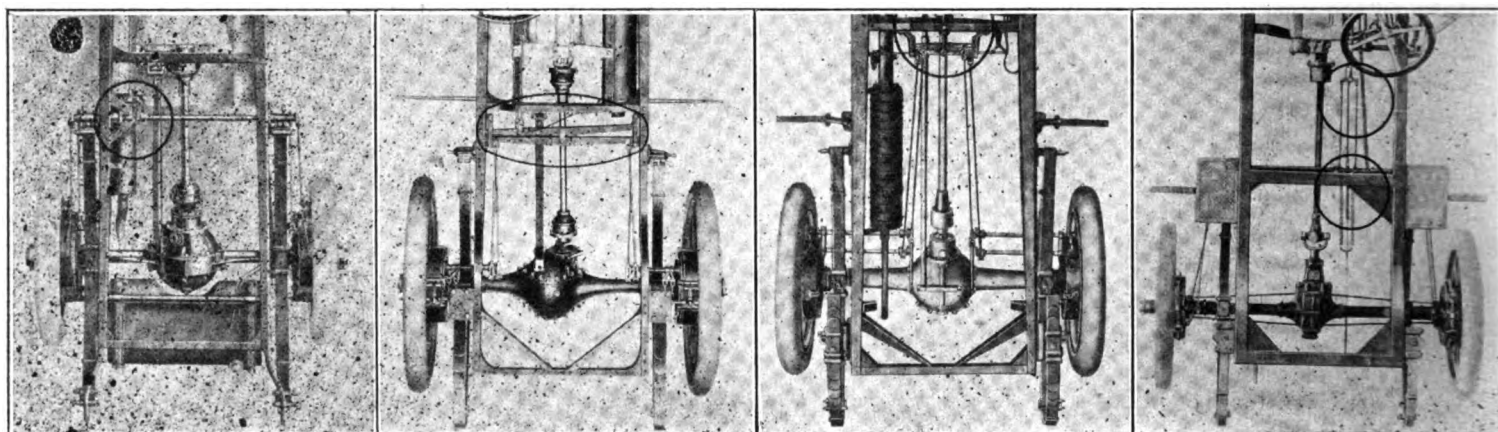
In the first place, if one brake is applied with greater pressure than the other, then the wheel to which it is attached sustains an excessive strain. Practically the whole retarding effect is obtained through the one wheel, and, neglecting the greatly increased tire wear which must result, the coefficient of friction between the one tire and the road is not sufficient to hold the car. The result is that the wheel slides over the road and the car skids. Even assuming that the one wheel does not lock, but is merely held more firmly than the other, the tendency is then for the vehicle to pivot around that wheel, and the ultimate result is the same—the car skids.

It is to insure the equal distribution of braking strains on both rear wheels that equalizers are used, and though there are any number of different methods of obtaining the result, the principle in each case is

when a strain is put on either the pedal or the hand lever it is transmitted to the center of the equalizer, which is free to swing within certain limits prescribed by the "play" in the brakes and the length of the slots in the chassis frame in which they are supported. The pressure applied to each brake therefore is equalized.

A system which is quite similar is used in Pierce-Arrow cars, the exception being that the supplementary cross shaft is eliminated, the rods from the equalizer bars being connected directly to the pedal and the hand lever. The arrangement of the equalizer bars also is slightly different, and they are drilled out to decrease their weight. From the ends of the bars, movement is transmitted to the brake bands by means of rods, as is the case in the Lozier arrangement.

Though such methods have the advan-



ALCO

OWEN

PREMIER

MAXWELL

brakes which must be considered. This last factor cannot be gauged accurately, any more than can the other, for the reason that either water or sand between the surfaces will modify the coefficient. It follows, therefore, that the application of the proper braking strain depends largely upon the driver—the "human element," so-called, in the equation cannot be eliminated. The best that the manufacturer can do, and in the majority of cases it is done, is to reduce the possibility of locking the wheels insofar as can be done, with due regard for the necessity of occasional quick stops, requiring that the brakes be applied almost to the point where the wheels slide over the road.

Searching through the numerous books dealing with automobile engineering, the phrase "careful adjustment of brakes is necessary" is one on which particular emphasis is laid. It is a fact that careful adjustment is necessary, but, on the other hand, more than a means of careful adjustment must be provided in order that the braking strain positively may be equalized. The reason for equalization almost is apparent without further digression, though the actual effect which results from poorly equalized brakes seldom is realized.

It is only in comparatively recent years that equalizers have come to be viewed as other than mere "talking points," though they have been in use on the more expensive cars, particularly those of the heavier class, and their genuine necessity now is realized; even the very low-priced cars now are equipped with them and a distinct advance in automobile engineering has been marked.

Perhaps the simplest method of equalizing the brakes is that which is used in Lozier cars and in similar forms on other cars. As may be seen in the accompanying illustration, the equalizer consists merely of a straight bar, or rather two bars, there being one for each set of brakes, emergency and service, the outer ends of which are connected to the brake bands by means of rods. From the brake pedal and the emergency brake lever, movement is transmitted to the equalizer bars through the intermediary of rods, one to the pedal and one to the lever, which in turn are connected to two transverse shafts, one of which is tubular and encloses the other. At the centers of these cross shafts there are two small cranked levers to which are attached rods which in turn are attached to the centers of the brake equalizers. Thus,

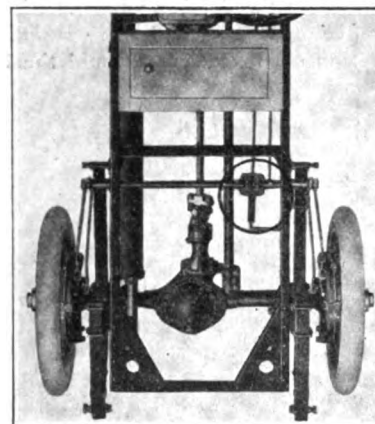
tage that the braking strain is positively and effectually equalized, and further that the minimum number of parts of a simple character are necessary. There remains the feature that they may be conducive to rattles. But, however, if there is no lost motion between the pedal or the lever and the bar, or between the brakes and the bar, rattles will not manifest themselves. Though there is little to get out of order in such a system, and little that is likely to give way under excessive strains, care should be taken to see that the slots in the side frame members are kept clean and free from obstructions such as may be accumulated on the road, or the equalizers will be no equalizers at all.

Though the effect obtained in the Alco arrangement is exactly the same, the equalizer bars are very much smaller and the system has the advantage that it is contained entirely within the chassis frame, where it is thoroughly protected. The bars themselves are scarcely more than a few inches in length and like the longer bars in the other arrangements are connected to the pedal and the hand lever at their centers by means of rods and shackles, making flexible joints. From the ends of the bars two rods connect with small levers at-

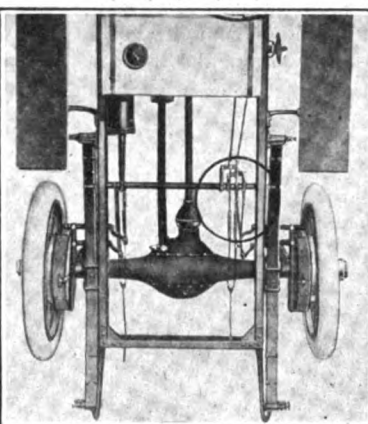
tached to cross shafts, which, in turn, are connected at their outer extremities outside the chassis frame to the brake mechanism by means of other rods, the length of which may be adjusted.

In attacking the problem, the designers of the Owen car have had recourse to the mechanical principle involved in a lever of the second class whose arms are of equal length. The equalizer bars, of which there are four, are the same length as the width of the chassis, and are mounted in fixtures which are bolted to the inside of the frame. The four bars are arranged two above the other and a connection to the pedal and hand lever is made at one side. The forward bar is free to move at the side where the pedal and lever connections are made, but is shackled at the other end. The connection to the brake mechanism is made from the two rear bars and the bars them-

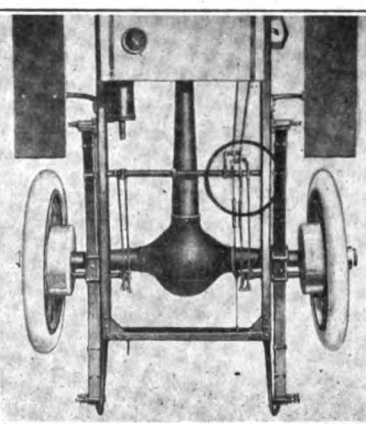
selves are connected to the forward bars at their centers. Thus when a strain is put on either of the forward bars the strain on the rear bar is multiplied two-fold by reason of the leverage obtained. At the same time the braking strain is equalized, for the reason that it is applied at the center of the rear bar, the connection to the brake mechanism being made through the intermediary of two rods at either side.



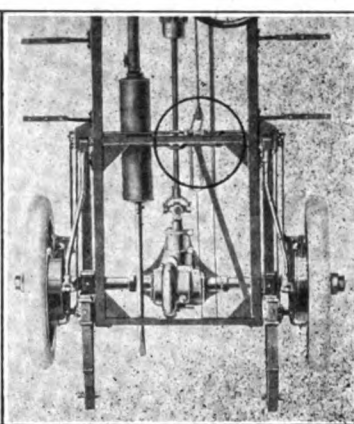
STEVENS-DURYEA



OHIO



OHIO



MAXWELL

levers and rods contained within the chassis. In another Ohio arrangement, the same construction is followed except that the cranks on the brake mechanism are carried nearer to the center of the chassis so as to permit of a straighter pull, thereby eliminating the possibility of binding.

In designing the newer models of Maxwell cars, the engineers have hit upon a method of construction which is unique, while at the same time it is effective and has the advantage that it is delightfully simple. As may be seen in the accompanying illustration, there really is no equalizer bar; instead, its place is taken by a short chain connected to cranks on the inner ends of a transverse shaft. The chain runs over a pulley at the end of a rod which is connected directly to the brake pedal. From the ends of the shaft movement is transmitted to the brake mechanism by means of outside rods.

Of course all such equalizing devices take no account of the actual coefficient of friction between the tires and the road, and for this reason some manufacturers still prefer to pin their faith to the propeller shaft brake, or as it sometimes is styled, the "transmission" brake. When a brake is located on the propeller shaft the braking strain on the rear wheels automatically

certain amount of strain on the differential mechanism and on the propeller shaft. It is true that the strain cannot be greater than the strain imposed by the engine in starting the car and that such wear as is caused comes on the back of the differential gears, but the fact remains that more work, imposed by braking strains, means more wear. Another objection is that an additional weight is placed on the bearings that support the propeller shaft.

In the case of brake equalization, as in many other cases, it is well-nigh impossible to attain the ideal. Today such mechanisms are more efficient than they were a few years ago, and it is likely that in years to come their efficiency will be raised even higher. That there is room for improvement is apparent, taking all the arrangements, by and large, into consideration. Though hydraulic or pneumatic operation has been suggested as the most satisfactory means of obtaining equalization, and in some few cases it has been tried, though with anything but the results which were expected, it is unlikely that such methods ever will come into vogue if for no other reason than that they introduce more or less complication and it is just such complication that it is the honest endeavor of every manufacturer to eliminate.

is equalized through the action of the differential mechanism. What is more, it is equalized proportionately to the amount of adhesion between each wheel and the road. That is to say, not only is the braking strain equally distributed when both wheels are traversing dry, hard macadam road, but also when one wheel rolls over slippery spots caused by mud or water. With the transmission brake, if the pressure applied is not sufficient to cause the wheels to slip on dry hard road, one wheel will not slip when a slippery spot is encountered, because the major portion of the braking strain is applied to the wheel having the greatest adhesion to the road. The other wheel sustains just such braking effort as the adhesion between the tire and the road will permit without causing it to slip.

There is an objection to the propeller shaft brake, however, in that it places a

REEVES MAKES SIX WHEELS SERVE

**Removes One Pair and Finds Advantages
Are Not Diminished—His Six-Wheeler
Ready for Marketing.**

After considerable experimenting, during which his original product, the Octoauto, which made its appearance about nine months ago, has been driven some 7,000 miles over the roads of the United States to demonstrate the faith of its inventor in the principles involved, M. O. Reeves, of Columbus, Ind., has so far modified his designs as to eliminate one of the four pairs of wheels with which the first car was equipped. Quite as appropriately as the first, the second model has been styled the Sextoauto, and will be manufactured by the recently formed Reeves Sexto-Octo Co., of which Reeves is the manager and

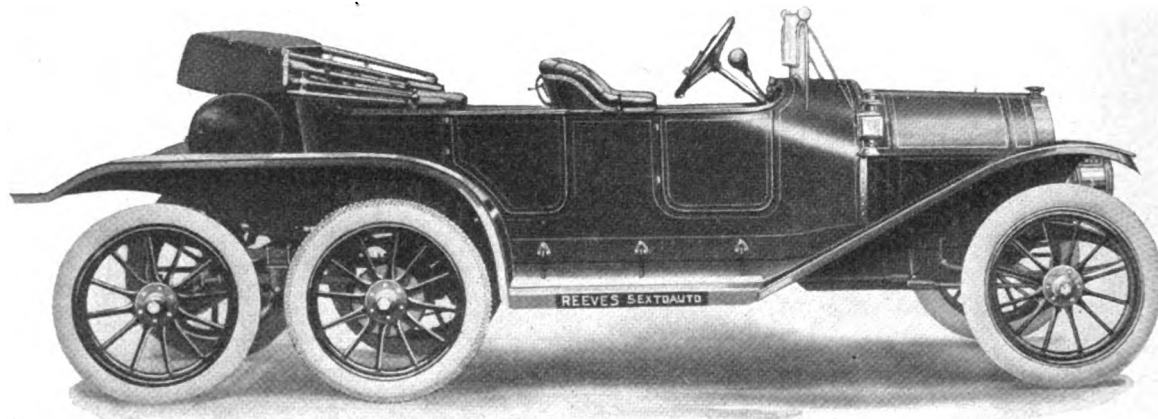
absorbing qualities of the four rear wheels and tires are felt.

The basis for the claim of greatly reduced body movement with consequent lessened discomfort to passengers and shock to the mechanism of the car, is that the majority of bumps or depressions in a road are three feet or less in length. With the ordinary vehicle either corner of the chassis is lowered or raised, according to whether a wheel drops into a hole or mounts an obstruction, by the height of obstruction or the depth of the hole. With the Sextoauto, however, the dropping of one of the rear wheels into a hole six inches deep, for instance, results in a body movement of but three inches by reason of the construction, which is according to the mechanical principle involved in a lever of the second class having arms of equal length.

Similarly, when the forward pair of wheels in the rear set are ascending from the hole the rear pair are descending, the result

centers is 156 inches. As for the motor, transmission and chassis, no change whatever has been made from standard practice other than a lengthening of the frame by 19 inches to accommodate the extra pair of wheels.

The motor is rated at 45 horsepower and has four cylinders which measure $4\frac{3}{4}$ inches bore and $4\frac{1}{2}$ inches stroke; ignition is effected by means of the Bosch dual system. Power is transmitted to the full-floating driving axle through the intermediary of a large leather-faced cone clutch and three-speed selectively operated change gear mechanism mounted in ball bearings. Both the front wheels and the drivers are shod with 34×4 inch tires, and the rear steering wheels carry $34 \times 3\frac{1}{2}$ inch tires; there are two separate sets of brakes, internal expanding for service and external contracting for emergency, and both sets are mounted on the driving wheels. Either four- or five-passenger bodies are supplied, at the option of the purchaser, and the list



REEVES SEXTOAUTO WHICH EXEMPLIFIES PULLMAN CAR CONSTRUCTION

the moving spirit. A factory has been acquired in Columbus, Ind., and the cars are to be marketed at \$2,500.

In eliminating two wheels and more or less machinery, however, Reeves still has adhered to the theory exemplified in the Octoauto, to wit: That three little bumps are easier to cushion than one large pump, a theory which has been in use in the construction of Pullman cars for many years. The Sextoauto is essentially the Octoauto but in a very much more modified form. The distinctive and exclusive rear construction, embracing four wheels in place of the usual two, is retained, though the front construction now is exactly the same as the orthodox type of four-wheeled automobile.

The greater simplicity of the six-wheeled construction over the eight wheels is apparent, and the results achieved by the change are that the cost of manufacturing is materially reduced, while at the same time approximately the same service can be obtained from the vehicle. This is explained by reason of the fact that the position of the passengers is over the rear wheels, where the easy riding and shock

being that theoretically the movement of the car body is nil.

Actually there is a slight movement, due to the resiliency of the springs, though even this slight movement is better cushioned than it is in the average car because the two pairs of wheels permit the use of longer springs. The front of the car, it is explained, acts the same as the front of any other car. That is to say, the front wheels of a car do not cause the amount of body motion that is caused by the rear wheels nor do they ride as "hard." For which reason, it has been deemed sufficient that the "Pullman" effect be confined to the rear of the vehicle, which, in the usual type of car, is the most uncomfortable place to ride.

The construction of the car is quite similar to the construction of the Octoauto, only one pair of the rear wheels being driving members, and the other pair being arranged to steer by means of suitable levers connected to the front wheels. Thus when the vehicle is turned it simply pivots around the driving wheels, which are in the center. The total distance between the front wheel centers and the rear wheel

price includes such items of equipment as top, windshield, speedometer and the usual complement of lamps and tonneau fittings.

Artificial Rubber Again "Discovered."

According to a cabled report from St. Petersburg, Russia, M. Ostromislensky, professor of chemistry at the Imperial Technical High School at Moscow, has succeeded by means of the influence of ultra-violet rays upon benzol in producing a substance which is said to resemble rubber in resiliency and elasticity. The reports also state that the entire rights to the invention have been acquired by Count Fatistcheff, head of the Bogatir Rubber Co.

Unlooked for Medal Pinned on Klaxon.

It is not often that honors are bestowed upon a man or company without their knowledge. That such things do happen, however, was instanced by the receipt this week by the Lovell-McConnell Mfg. Co., Newark, N. J., of a medal and a diploma awarded to the makers of the Klaxon by the Brussels Universal Exposition of 1910. The Lovell-McConnell people were not aware that they had been so honored.

FUNCTIONS OF THE REDUCING VALVE

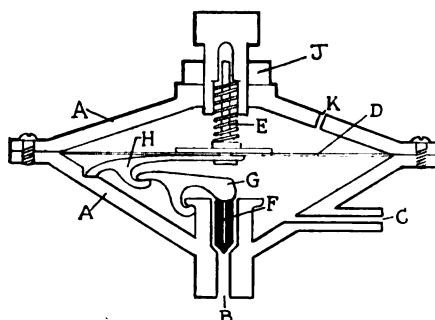
Little-Understood Device Made Prominent by Automatic Lighting Systems—Bullard's Valve as an Example.

Among users of motor cars there may be one in a hundred who has an idea what is inside the mysterious looking brass affair called a "reducing valve" or a "gas pressure reducer." More likely there is not. The "works" of the little brass box is a mystery, though many people know that the purpose of a reducing valve is to reduce a high pressure, as of gas in an acetylene tank, to a low pressure, not too high for the burners. On a motor car the place for a reducing valve is on the acetylene gas tank, at the outlet. Gas is stored in the tank at a pressure of something like 250 pounds to the square inch, while the burners require only about four ounces. By the usual procedure of opening the tank valve very slightly it is of course possible to allow the gas to flow so slowly that the burners will not "blow" or flare; but this must be done each time the lamps are lighted and must be done at the tank, for it is a matter of great difficulty to get piping on a motor car to hold high pressure without leakage at the joints, and for this reason a valve in the line is usually impracticable. A good pressure reducing valve, however, which permits only a few ounces line pressure allows the use of valves in any part of the line, and obviates risk of leakage due to high pressure. Dashboard control of the lamps thus is made quite practicable.

While the construction of a reducing valve is not particularly complicated, it is so little known that the accompanying diagram of a typical valve will doubtless be of interest. The casing (A A) is made up of two concave brass castings fastened together at the edges with machine screws. The disks are about three inches in diameter. A diaphragm (D) of airtight fabric is stretched across the chamber between the two halves of the casing, being clamped between the edges, and divides the space into two separate compartments. To the center of the diaphragm is secured a brass disk which carries a spindle (E) projecting into a hole drilled in an adjusting screw in the center of the upper half of the casing. The spindle does not reach to the end of the hole, but forms a center for a spiral spring which is slightly compressed between the adjusting screw and the brass disk in the center of the diaphragm. A locknut (J) on the adjusting screw prevents its turning when set. In the center of the lower half of the case there is a connection by means of which the valve is screwed to the acetylene tank; a passage (B) admits gas to the valve. The inner half of this gas passage is counterbored or enlarged and a tapered seating for the

hard rubber needle-valve (F) formed in it; the hard rubber valve is a loose fit in the hole, but when its point is pressed against the seat the gas is completely shut off. A groove in the side of the valve affords additional room for the flow of gas. One end of a little lever (G) rests on the top of the valve, and the other end rests on a finger which is an integral part of a second lever (H). One end of the lever (H) is forked and rests on a button fastened to the center of the brass disk of the diaphragm (the hole through which the shank of the button passes is made airtight, of course), and the opposite end of the lever rests in a notch in the casing. Finally, there is a small air hole (K) in the upper half of the casing and a nipple (C) to which the line pipe is connected.

When the tank valve is closed and there is no pressure in the casing of the reducer, the diaphragm (D) is pressed downward by the spiral spring; there is no pressure



BULLARD REDUCING VALVE

on the levers and the valve (F) is loose in its seating. When the gas is turned on, however, its pressure forces the diaphragm (D) upward; the button under the diaphragm raises the end of the lever (H), which in turn raises the lever (G), which presses the valve (F) into its seat—if the pressure of the gas is sufficient to push the spring (E) far enough. If the spring pressure is so great that the gas pressure can only partly overcome it, the valve (F) will be pressed toward its seat but will stop short of closing the gas passage when the pressure of the gas on the lower side of the diaphragm is equal to the pressure of the spring above it. If the adjusting screw is turned down so as to increase the pressure of the spring the gas pressure is less effective in moving the diaphragm, levers and the valve, and so the gas passage is kept open.

To give an example of the practical working of the instrument, let it be assumed that it is attached to the gas tank by means of the connection at (B) and that the outlet (C) is connected to the line pipe leading to the lamps; in the line pipe there is a pressure gauge. The pressure in the tank is 250 pounds to the square inch, and the pressure desired for the line pipe is six ounces. The gas is turned on by means of the tank valve and flows to the gas chamber of the reducer. Assuming that

the adjusting nut is screwed down pretty well, so that the gas pressure can move the diaphragm only slightly, the valve (F) is held well off its seat. But the pressure keeps rising as more gas flows in from the tank, until finally a point is reached where the pressure of the spring is overcome and the valve is closed. The gauge shows a pressure of, say, three pounds to the square inch, which if course is a great deal too high. By backing off the adjusting screw the spring pressure is decreased so that the pressure of the gas can close the valve further. By adjusting the spring to the right tension the valve can be set so that as soon as the pressure rises above the desired six ounces the gas passage will be closed until the pressure drops enough to allow the spring to force the valve open again. In actual practice the valve does not alternately open and close, but remains slightly open—just enough to allow a steady flow as gas at the pressure for which the spring is set. This occurs while the lamps are burning and a constant flow of gas is taking place. If the lamps are suddenly shut off, the gas pressure, backing up, so to speak, against the diaphragm, closes the valve and keeps it closed until gas is again allowed to flow, reducing the pressure and allowing the valve to open again. Thus nothing more than the desired six ounce pressure can pass the reducer.

While practically all reducing valves work upon the same principle as that which governs the action of the one described, this particular instrument has the advantage of being wholly free from pins, pivots and similar small parts, and in assembling it the parts are merely hooked together as shown in the diagram. The use of a double system of leverage results in a considerable pressure on the valve (F), which makes for gas-tightness—the higher the pressure the tighter the valve is closed.

The Foster Devices Co., of 146 West 56th street, New York, is the sole sales agent for the United States for the valve. The valve is made by the Bullard Mfg. Co., of Springfield, Mass. It is built for pressures up to five pounds to the square inch on the outlet side; for the heavier pressures the diaphragms are of metal but otherwise the construction is the same.

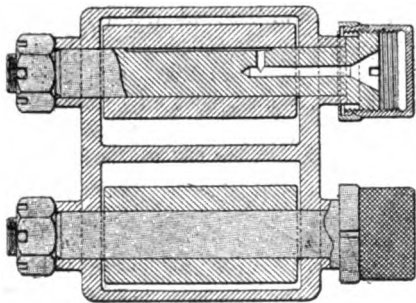
Elimination That Was Not Intended.

Certain New Yorkers who had been discussing the elimination of unnecessary parts of automobiles are repeating with gusto the story told by one member of the party.

"It may be possible to eliminate quite a few of them," he is credited with saying, "if a man tried hard; for I knew a man who once took down his car and who when he reassembled it found 65 pieces for which he could find no places. So he just threw them in the scrap heap, and the car ran as well as ever. And he wasn't even trying to eliminate."

Spring Shackle That Lubricates Itself.

Little squeaks, not inaptly styled "canary birds" by those who have driven or ridden in automobiles long enough to name their parts or their idiosyncrasies, are just as offending to French ears as they are to other ears, or perhaps they are a little more so, for a firm of French manufacturers, Messrs. Lacoste, of 28 Boulevard de Strasbourg, Paris, have placed on the market a recently patented spring shackle that is calculated to kill more than one bird of the kind; it is illustrated in section herewith. In the ordinary spring shackle, owing to the comparatively small amount of clearance between the bolt and the shackle, there is difficulty in forcing grease between them in sufficient quantity to effect thorough lubrication. Incidentally, the grease that is forced between them remains practically in one place and thus there usually is more or less surface which remains practically dry and therefore causes sundry squeaks. In the Birkigt spring shackle, however, Birkigt being the name of the



BIRKYT SPRING SHACKLE

inventor to whom the patent has been issued, such troubles are overcome by the simple expedient of providing a long, narrow groove longitudinally in the shackle bolt. Otherwise, the device is quite similar to the usual type, the grease being contained in a screw grease cup at the end of the bolt. From the grease cup a passage is drilled in the center of the bolt, communication with the groove being established by means of a short passage drilled at right angles to the central passage. Thus when the grease cap is screwed down the grease is forced out along the groove and reaches the whole surface of the bolt.

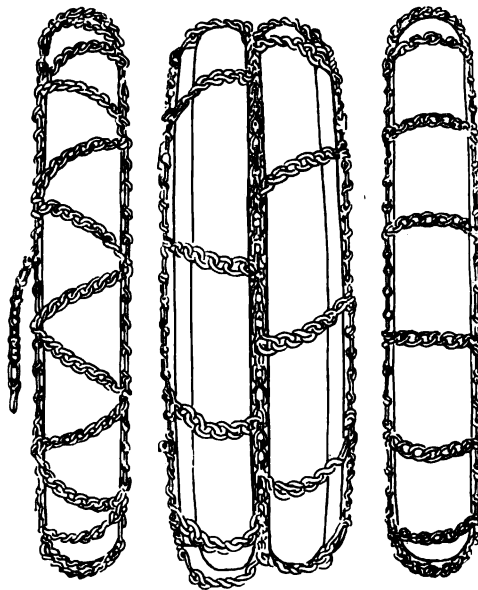
What It Costs to "Split" a Chassis.

When the famous "split" or "halved" chassis of the Flanders "20" was shown at the automobile shows of New York and Chicago, argument and discussion waxed high as to just how it was done—and not the least part of the argument was as to what it must have cost the company to accomplish the feat. According to Clement Studebaker, Jr., first vice-president of the Studebaker Corporation, the expenses for this mechanical wonder were \$10,000—\$800 for the chassis and \$9,200 for the labor in halving each part separately and fixing it in position. The sales department of the Studebaker Corporation insists that as an

advertising stunt it was cheap, having paid for itself a thousand fold, while as an education in automobile construction it has been a revelation to tens of thousands of visitors, who theretofore had but a hazy idea of the interior arrangement of the "works" of an automobile.

Gripwell Brings Out Non-Creeping Chain.

That necessity truly is the mother of invention again was instanced when as a result of the decision of the United States District Court of Appeals in Chicago upholding the Parsons-Weed tire chain grip patent, the manufacturers affected turned their inventive faculties to the development of chain grips which they believed avoid conflict with the Parsons-



GRIPWELL TIRE CHAINS

Weed rights. Among the most prominent of these manufacturers is the H. Channon Co., of Chicago, whose new Gripwell chains are shown by the accompanying illustrations. To prevent creeping or slipping on the tire, as in the Weed chain, they are provided with retaining chains passing around the felloe of the wheel, and they are offered by their makers as devices that infringe no patent of any kind.

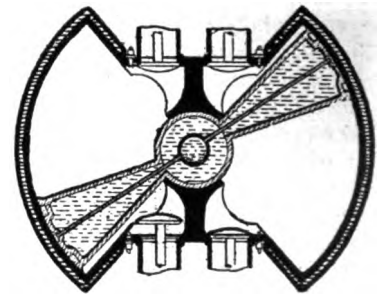
The Gripwell anti-skid chain consists of two rings of chain connected by a series of short lengths; the short chains cross the tread of the tire while the rings run around the sides and the retaining chains, of which there are two, cross the felloe just as the grip chains cross the tire. The cross or tread chains are made of special stock, the steel being heat treated and case-hardened so as to resist wear; the hardening process is said by the makers to be more than a superficial skin, but not such as to make the metal brittle. The links are shaped so that they lie close to the tire without cutting the rubber. The construction is such that a broken or worn out cross chain can be replaced by a new one with little trouble, and a complete set of new cross

chains costs less than half the price of a complete new chain grip. Particular attention is called to the fact that the chains are designed to run tight and not creep.

Several styles of Gripwell chains are made, including straight and diagonal forms, as well as special types for commercial vehicles having twin tires. These have central chains running around the rims between the twin tires and cross chains running from the central chains to both outer chain rings. Special snap-hooks, lever hooks and connecting links are made for use with the chains.

Engine That Eliminates the Piston!

Giving evidence of imaginative powers that would do credit to Marie Corelli and inventive genius that is second only to that of the persons who attempt to obtain patents for perpetual motion machines, a foreign inventor has evolved an engine that is so radically different from anything else of its general kind that has been produced that it is bound to invite notice if for no



CARMICHAEL-SHAIBEY CYLINDERS

other reason than that it seems as impracticable as it is unique. It is styled the Carmichael-Shaibey, and, as may be seen in the accompanying cross-sectional drawing, it has been the object of the inventor to eliminate pistons, piston rods and cranks at one fell swoop; little else regarding its construction has been disclosed. Instead of a piston, each cylinder is fitted with a paddle-like member which divides the cylinder, or, rather, the chamber, into two parts. This member is cooled internally by water and receives an impulse on its upper and lower side alternately, making the engine double-acting and giving to the crank shaft, if it may be so styled, an oscillating movement. As the cylinders are provided with four valves it presumably operates on the four-cycle principle.

Another Truck to Use Internal Gear.

The General Industrial & Mfg. Co., of Indianapolis, which was organized some months since to manufacture a popular price light delivery wagon, among other things, has gone so far as to adopt an internal gear drive for its transmission. C. H. Wallerich, general manager of the General Industrial company, previously was associated with the Mais Motor Truck Co., of Indianapolis, which partially accounts for the adoption of the internal gear drive.

AMERICAN CARS IN FRENCH CONTEST

There Were Six of Them But Three Were Disqualified—Newspaper "Tour" That Lasts Twenty Days.

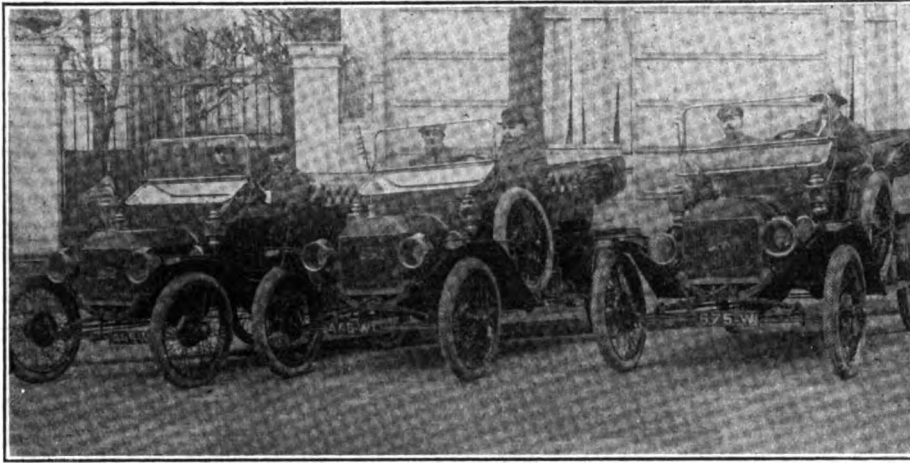
Six American cars are among the 67 participants in the Tour de France, which has been organized by the French journal "L'Auto," and which started on March 1 from Paris, to be finished in the same city on March 20, after having covered 3,863

2	Nancy-Besancon	295	612
3	Besancon-Lyons	212	824
4	Lyons-Grenoble	115	936
5	Grenoble-Nice	340	1,279
6	Exhibition at Nice.....		
7	Nice-Marseilles	231	1,510
8	Exhibition at Marseilles		
9	Marseilles-Montpellier.	169	1,679
10	Montpellier-Toulouse .	254	1,933
11	Exhibition at Toulouse		
12	Toulouse-Bordeaux ...	398	2,331
13	Bordeaux-Nantes	333	2,664
14	Exhibition at Nantes..		
15	Nantes-Le Mans	254	2,918
16	Le Mans-Rouen	279	3,197
17	Rouen-Lille	228	3,425

and Nice. It is furthermore claimed that the advertising methods used by the Ford crew and management along the route did not meet with the approval of the race jury, and for these several reasons the Ford cars were excluded from further participation in the run. The cars are continuing the tour, nevertheless—though as non-contenders, of course. Exhibitions are scheduled in the five leading cities along the tour: Nice, Marseilles, Toulouse, Nantes and Lille.

Warren Car Creates New Non-Stop Record.

The "glorious climate of California" has assisted in the establishment of another record that is of quite a different character to the last one made there when Harvey Herrick, driving a National, hung up world's figures of 74.63 miles an hour in the Santa Monica road races last fall. It is a non-stop pleasure car record, and the car with which it was made is a Warren "30," driven continuously under the guidance of Messrs. Krauss, Vesper and Dandy, of the Matheson Sales Co., which is the distributor for Northern California for both Warren and Matheson cars. The car was started on January 20th and at the last report still was going strong. Though a momentary stop was made to clean out a clogged gasoline pipes after some 5,000 miles had been covered, an additional 10,380 miles subsequently was traveled without another stop. As a matter of fact, either one of these distances constitute a record, for the simple reason that never be-



FORD TEAM THAT WAS DISQUALIFIED IN THE TOUR DE FRANCE

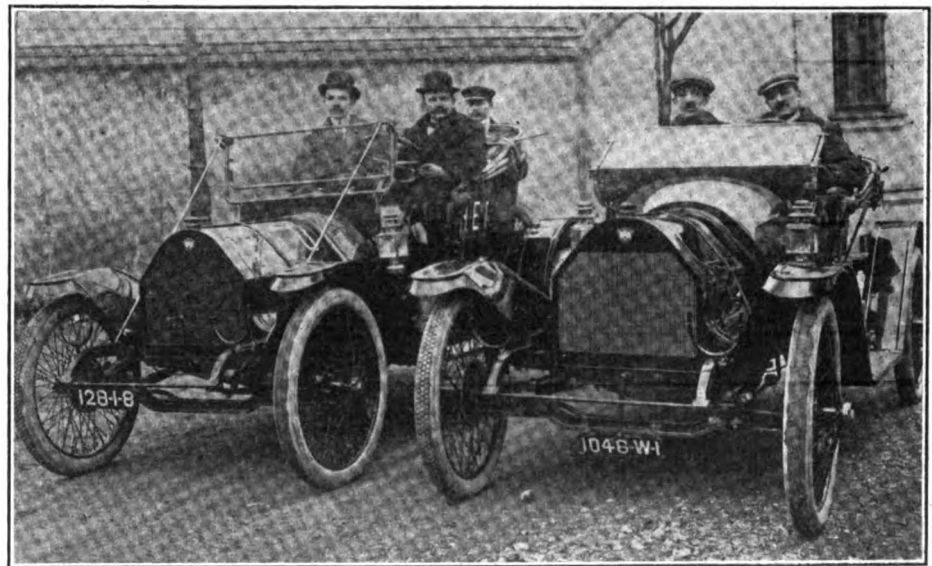
kilometers (2,400 miles) and visited many important cities in France. The Americans represented are three Fords, two Reos and one Hupmobile.

The tour, which is the first under the new auspices, and which is not to be confused with other "tours around France," is limited to light cars, and is conspicuous partly because of the absence of most of the better known French manufacturers. It began at 7 a. m. in Champigny, a suburb of Paris, with the departure of one of the Ford cars, followed by the two other Fords, the team having drawn the numbers 1, 2 and 3, respectively. At one minute intervals the other cars departed in the following order: 3 Barres, 1 Hurtu, 2 Crespelles, 3 Doriots, 3 Alcyons, 1 Hupmobile, 3 Cortes, 2 F. L.'s, 3 Benz, 2 Reos, 2 Simplicias, 3 Pilains, 3 Schneiders, 1 Majola, 1 D. S. P. C., 1 Rozier, 1 Turicum, 1 De Bazelaire, 1 Optima, 3 C. I. D.'s, 1 Bugatti, 2 Scars, 1 Muller-Mignot, 2 Stimulas, 2 Roys, 2 Delages. The Benz cars are conspicuous because of carrying not one but two spare wheels.

The route leads from Paris in a southeasterly direction along the Alsatian, Swiss and Italian frontiers to the Mediterranean; then follows the south coast, turns northward along the west coast and finally traverses the Seine valley and champagne territory of Rheims and Lille. The complete itinerary of the trip is here appended:

Mar.	Daily Distance. Kilom.	Total Distance. Kilom.
1	Paris-Nancy	317

18	Exhibition at Lille....		
19	Lille-Rheims	267	3,692
20	Rheims-Paris	176	3,868



WIRE WHEEL REOS IN THE TOUR DE FRANCE

Early in the run differences developed between the international contestants and a protest was filed by several of the contenders, among whom were the Hupmobile and Benz crews, against the alleged unsportsmanlike attitude on the part of the members of the Ford crew, and charges were brought before the race jury in connection with alleged improper gearing of the Ford machines on the road between Grenoble

fore has the American Automobile Association sanctioned and observed a non-stop pleasure car run. In continuing the trial, however, it has been the object of the Matheson Sales Co. to eclipse completely every other attempt of the kind, sanctioned or unsanctioned, which has been made with a pleasure car and to put up a real record which will worry anyone who attempts to better it.

PISTON DISPLACEMENT ADOPTED

British Governing Body Finally Accepts the Logical and Modern Standard—The Several Classes Provided For.

After lengthy deliberation, and following the initiative of their American cousins, British racing authorities at length have come to the realization that the only sane way to rate internal combustion engines is according to their piston displacement or the cubical contents of their cylinders, and the Royal Automobile Club has acted accordingly.

For years British engines have been rated according to the bore of their cylinders only, without reference to the stroke of the pistons, and it is under such obviously faulty rating that all the seemingly wonderful British racing records have been made. The government taxation rating also takes no account of the stroke, and though the method undoubtedly is all wrong, permitting as it does the rating of a given engine at approximately 15 horsepower when according to bench tests and the cubical contents of the cylinders it really should be rated at twice the figure, it has had one advantage in that it has stimulated the production of long-stroke engines. Whether some of the engines which have been developed as a result, as, for instance, those in which the stroke is twice or even two and one-half times the bore, really are as efficient thermally and mechanically as similar engines in which the piston displacement is the same and the bore to stroke ratio is closer to the rational, still is open to question. It has been amply proven, however, that the long-stroke engine in which the bore to stroke ratio is determined within certain limits, approximately 1 to 1½, is more efficient and generally desirable for other reasons than the "square" engine, which, as a result, gradually but surely is going out of favor.

According to the new "cubic capacity classes" which just have been formally approved and passed by the Royal Automobile Club for incorporation with the other Brooklands Standards Classes, which it is to be inferred will be continued, there are created no less than nine separate divisions for cars varying in piston displacement from 100 to 850 and over cubic inches. Though the smallest class under the rules of the American Automobile Association includes everything under 160 cubic inches, between 100 and 175 cubic inches there are three classes under the new R. A. C. rules. Apparently it is the purpose of the sports governing body to encourage the development of small powered cars to an even greater extent than it has in the past. Another important difference in the new classes of the R. A. C. and those of the A. A. A. is that the minimum weight which is prescribed must include the driver. The new table of classes is given in complete form herewith, and that it has "caught on" even in the short time it has been in force is evidenced by the fact that already records have been established in class A, which includes the smallest engines.

Montgomery's Mixed Racemeet.

By sandwiching automobile racing between a number of aeroplane flights, which took up the greater part of the program, and several motorcycle races, the Alabama Automobile Association provided the natives of Montgomery with a wonder that was just one day short of the seven-day variety; it was a combination meet held on a one mile dirt track, and under the management of J. S. Berger, who was the moving spirit, lasted from Monday, 4th inst., until Sunday last, 10th inst. Needless to add, a goodly crowd was in attendance during each of the four days.

According to the original schedule, races between local automobile drivers were scheduled for every one of the six days, but continued rain and a slippery track played hob with the program and made postponements and more postponements

necessary. The result was that but one race was run on Monday, two on Tuesday, one on Wednesday, Thursday and Friday were skipped entirely and the meet wound up with a 50-mile free-for-all on Saturday. In nearly all the the races the products of the Studebaker factory showed in front. Francis Ludgren in a Flanders accounting for a five-mile event on Monday, with Harry Cohen in an E-M-F second, and the same men finishing in the same order, followed by George Odom in an E-M-F in another event of the same length held the next day. In a 10-mile race, held on Tuesday, however, Odom, in the same car, showed to better advantage and romped home in 11:38. Ludgren repeated his previous victories in a five-mile event on Wednesday, with Cohen (E-M-F) second and Odom, this time driving an Overland, third. The time was 6:05. Percy Black, driving an American, won the slow "race" on Saturday, requiring 19:41 to complete one lap of the track, and on Sunday Odom carried away the prize for the 50-mile race. His time was 55:37, and he defeated Barr (Stutz), Munn (Overland), Ludgren (Flanders) and Kates (Flanders), who finished in that order behind him.

Bar Harbor Wants to Lift Barrier.

Having enjoyed the distinction of being dwellers in the only district in the United States in which automobiles are forbidden, the residents of Bar Harbor, Me., which is the summer home of many wealthy persons, have come to the conclusion that the absence of automobiles from their roads is not such an unmixed blessing, after all, and would like to change the law. By a vote of 469 to 172 the township of Eden, which lies in the very center of the affected district, last week passed a resolution asking the legislature to pass an act establishing a continuous automobile highway from Mount Desert Island bridge to Bar Harbor, and as it is stated that the sentiment in the legislative body is favorable to the abolishment of the restriction on motor cars, such a bill is likely to be enacted.

Letter of Class.....	A	B	C	D	E	F	G	H	J
*Maximum cylinder capacity in cubic inches.....	100	125	150	175	235	305	475	850	over 850
*Maximum cylinder capacity in cubic centimeters.....	1639	2048	2458	2868	3851	4998	7784	13929	over 13929
*Minimum cylinder capacity in cubic inches.....		101	126	151	176	236	306	476	851
*Minimum cylinder capacity in cubic centimeters.....		1640	2049	2459	2869	3852	4999	7785	13930
†Weight in pounds.....	1400	1500	1600	1800	2000	2250	2500	2700	3000
Maximum stroke in in. for a bore of 2½ in. (4 cyl.)....	5.118	6.391							
Maximum stroke in mm. for a bore of 65 mm. (4 cyl.)...	123.5	154.3							
Maximum stroke in mm. for a bore of 70 mm. (4 cyl.)...	106.5	133.0	159.7						
Maximum stroke in mm. for a bore of 75 mm. (4 cyl.)...	92.7	115.9	139.1	162.3					
Maximum stroke in in. for a bore of 3 in. (4 cyl.).....	3.554	4.438	5.322	6.207					
Maximum stroke in mm. for a bore of 80 mm. (4 cyl.)...	81.5	101.8	122.2	142.6	191.5				
Maximum stroke in mm. for a bore of 85 mm. (4 cyl.)...		90.2	108.3	126.3	169.7				
Maximum stroke in in. for a bore of 3½ in. (4 cyl.)....		3.261	3.910	4.560	6.119				
Maximum stroke in mm. for a bore of 90 mm. (4 cyl.)...			96.6	112.7	151.4	196.4			
Maximum stroke in mm. for a bore of 100 mm. (4 cyl.)...				91.3	122.6	159.1			
Maximum stroke in in. for a bore of 4 in. (4 cyl.).....				3.491	4.685	6.077			
Maximum stroke in mm. for a bore of 110 mm. (4 cyl.)...				75.4	101.3	131.4			
Maximum stroke in in. for a bore of 5 in. (4 cyl.).....						3.889	6.054		
Maximum stroke in in. for a bore of 6 in. (4 cyl.).....							4.204	7.520	
Maximum stroke in mm. for a bore of 155 mm. (4 cyl.)...							103.1	184.5	
Maximum stroke in mm. for a bore of 190 mm. (4 cyl.)...								122.8	

*Fractions of a cubic inch or cubic centimeter will be reckoned as 0.0 if below .5 and as 1.0 if .5 or over. †Minimum weight, includes driver. Note—1 cub. in. = .68706 cub. cm. 1 cub. cm. = .0610237 cub. inches.

STEEL BODIES FOR MOTOR TRUCKS

**How Alco Has Borrowed from Modern Railroad Practice to Good Advantage—
Their Strength and Durability.**

Despite the fact that only during comparatively recent years the prominent railroad companies of the world have come to appreciate the superiority of steel over wood for the construction of the super-

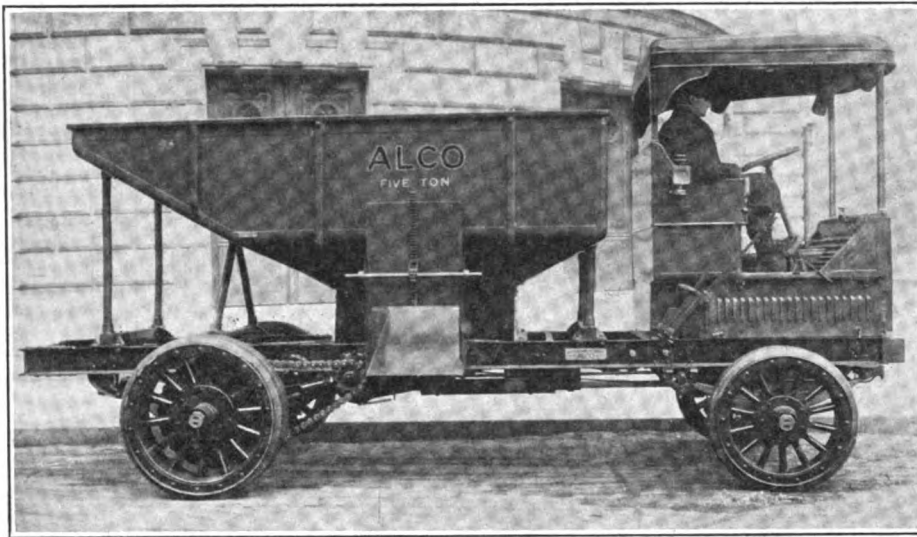
terial of a combustible nature is used is completely insulated and isolated from the parts where fires usually originate.

Two of the new bodies are shown herewith, the chassis in each case being the standard model such as regularly is supplied. The closed body is built on the two-ton chassis and is intended primarily for brewery service, though it would prove of equal value in the transportation of other goods of a fragile nature which require to be covered in transit. Differing from the

self-dumping type, in which the load naturally gravitates to a chute at the side, whence it is discharged; it was designed for the transportation of coal.

Electric Starter Propels a Gas Car.

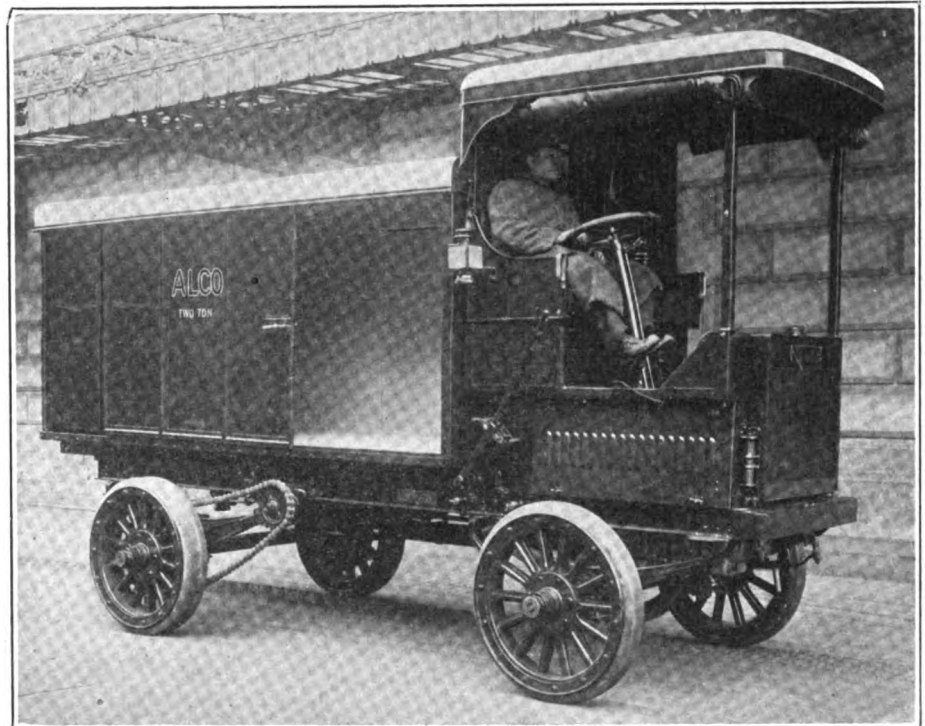
To those who may entertain doubts as to the power and reliability of the electric engine starting device, a novel method of demonstration employed by L. B. Hart, manager of the Inter-State Motor Car Co., of Kansas City, should serve as enlightenment of no uncertain kind. All the later models of Inter-State cars are equipped with the Aplco electric engine starting and lighting system, and it was to furnish visible proof of the ability of the system to "turn the motor over" for protracted periods, while at the same time maintaining all five lights of the car in a state of brilliancy, that the unique demonstration was made. The system itself consists of a storage battery "floated on the line," in the parlance of the electrician, and a combination motor and dynamo, suitably connected to the engine, by means of which the battery is maintained fully charged and the engine is started. By way of indicating the power of the electric motor and the capacity of the battery, the car was driven through the engine by means of the electric motor all the way from the Kansas City automobile show, held in Convention Hall, to the new salesrooms of the company at 1715 McGee



ALCO FIVE-TON ALL-STEEL COAL RUCK

structures of their rolling stock, it is doubtful if there is any one other advance which has been made to which increased earning power, as expressed by greater capacity and lessened depreciation, can be as directly attributed. The latest and most up-to-date railroad engineering practice eliminates practically every sliver of wood and all other combustible material in so far as it is possible, and in the majority of cases the benefits derived from such modern construction may be read in no small figures on the credit side of the ledger.

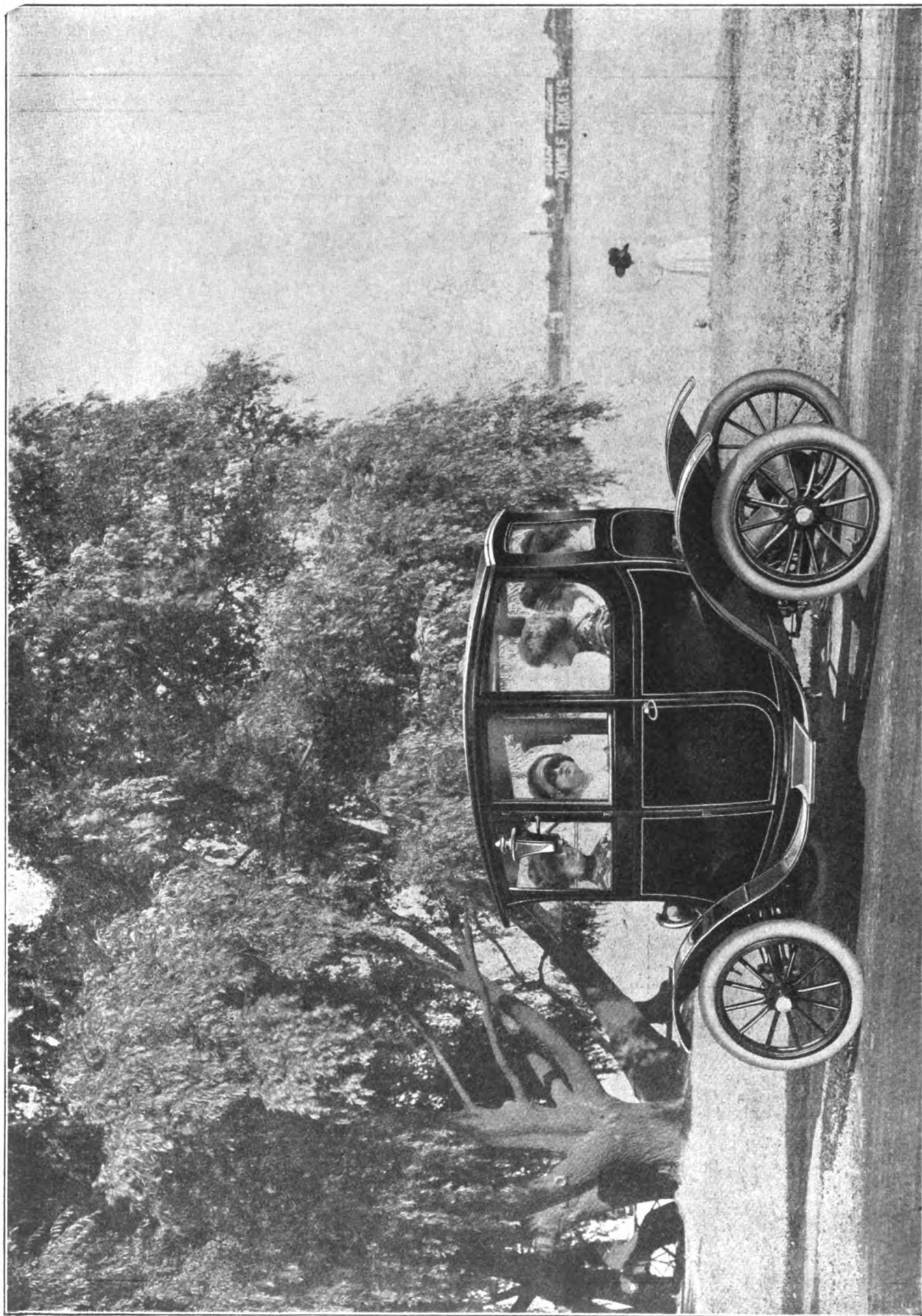
In view of such facts, and others which are equally obvious, the action of the American Locomotive Co. in adopting as standard equipment a line of all-steel bodies for its Alco motor trucks is altogether within the scheme of things and is only one of the many indications of the readiness of automobile engineers to take a leaf out of the other engineers' books when exigencies warrant and the visible results mark a distinct advance over past or present practice. In adopting steel bodies for special adaptations, however, the manufacturers of Alco trucks have carried the idea even a little further than have the majority of railroad engineers, with whom it safely can be said to have originated. Which is to say, the Alco bodies are all-steel in the true sense of the expression, barring only the driver's seat cushion and the cab curtains there is not even a splinter of combustible material in their make-up; obviously they are absolutely fireproof, for what little ma-



ALCO TWO-TON ALL STEEL BREWERY TRUCK

usual practice, the construction embodies the use of sliding doors at the sides, the object being to facilitate loading and unloading by permitting the truck to be driven alongside a platform instead of being backed in. The other body is built on the five-ton chassis and is of the stationary,

street, a distance of approximately half a mile. Though two passengers were carried and considerable maneuvering was done after the salesrooms were reached, that the battery still was far from exhausted was indicated by the fact that the lamps were burning brilliantly.



Flanders Colonial Electric

ISN'T SHE A BEAUTY—"Un

Equipage digne d'un Roi?"

JUST LOOK HER OVER—this Flanders Colonial Electric. Was ever a more artistic carriage built? Is it any wonder the advent of this car has revolutionized design in electrics and ladies of taste refuse to buy the obsolete, highly perched, short wheel base, bonneted old style.

OF COURSE YOU KNOW there have been delays in deliveries—car didn't suit us when the first batch was finished so, instead of sending them out and letting dealers take the brunt of it, we just held up the whole bunch, added six cells of batteries—which of course required remodelling of the body at the rear to make room for them—and today we are delivering the most efficient as well as the most beautiful electric ever made. That's the Flanders way. The more you know about it the more you like it.

DOING NICELY NOW, THANK YOU. Shipping six electrics a day and rapidly getting into our old stride.

HERE'S THE BEST PART OF IT: You know we always expect a lot of cancellations on a new product which can't be delivered fast enough. We count on it—and it is the best advertising we can get. For every cancellation two other orders come in. Humanity always wants most that which is unattainable.

BUT THE FLANDERS ELECTRIC has set a new standard in this regard. Despite the delay less than five per cent. of original orders have been cancelled. Dealers tell us customers get sore—

FLANDERS MANUFACTURING CO.,

WALTER E. FLANDERS
President

Factories, Pontiac and Chelsea, Mich.

but they won't cancel and they will not accept a substitute. Great, isn't it?

BUT THERE'S A REASON. Look at the Flanders Electric—not the picture but the vastly more beautiful car itself. Can you imagine anyone of taste accepting any other after once having seen this one. **AND CAN YOU IMAGINE** any sane person paying a thousand dollars more for a car of less efficiency—less radius, less speed—of less passenger capacity—and superior in no detail of coachwork, finish, trimmings or appointments?

ARE WE MAKING A PROFIT ON IT? Well that isn't your worry. Nor the customers. Frankly, we won't pay one hundred per cent. dividends this year from the profits on this electric. Confidentially—strictly confidentially—we may have to increase the price. For of course we will not lessen the quality. But meantime we'll keep faith with a lot of good friends and deliver cars that are on order. But that isn't your worry either—is it?

WHAT YOU ARE INTERESTED IN, as a dealer looking for the kind of cars that sell themselves and made by concerns with a reputation for broad gauge dealing and standing back of their product, is—can you get the agency, and if so, can you get cars to fill your orders.

ONLY WAY TO FIND OUT is to write—or better still come to the factory, look us over and see and ride in the car itself. Then we will tell you just what to expect—which will be about half the Flanders Electrics you can sell in your town.

Kansas City Regulates the Pedestrian.

In an effort to protect the pedestrian from his own impetuosity in crossing busy city streets, the board of aldermen of Kansas City, Mo., has passed an ordinance making it unlawful for a pedestrian to cross the streets in the "down-town" business section save at the regular crossings. The ordinance also regulates automobile and carriage traffic at such crossings, but its most sweeping requirement is that forbidding the pedestrian to encroach upon the territory of the horse and motor-propelled traffic. This new ordinance is in line with the various legal decisions rendered in other parts of the country, according to which

a pedestrian need not exercise especial care—need not "stop, look and listen"—when crossing a street at the regularly established crossings, but which hold him responsible of contributory negligence when he dodges in and out of traffic.

German Courts Disagree on Klaxon Horn.

Although the courts of Stuttgart and Berlin, Germany, recently declared the Klaxon electric horn to be possessed of a note "deep-toned" enough to come within the meaning of the strict German automobile laws, the court of Wiesbaden, the famous German watering and health resort, has decided that such a horn was not per-

missible within the limits of the city of Wiesbaden. When the court's attention was called to the decisions of the two other courts, the presiding judge declared with some show of heat and local "patriotism" that, while the electric horn might suit the police commissioner of Berlin and the judges of Stuttgart, it did not by any means suit the Wiesbaden judges; he furthermore stated that conditions in the traffic of the three cities were totally different and that Wiesbaden was not bound by Berlin regulations—all of which objections he merged in the infliction of a fine on the Klaxon user. The automobile interests probably will carry the case to the higher court.



INDEX TO ADVERTISERS



A	
Abbott Motor Car Co.....	1147
Adamson Mfg. Co.....	1148
Ajax-Grieb Rubber Co.....	1131
American Ball Bearing Co.....	1148
American Motors Co.....	1147
American Starter & Carburetor Mfg. Co.....	1141
Argo Electric Vehicle Co.....	1140
Atwater-Kent Mfg. Co.....	1095
Automobile Supply Mfg. Co.....	1144

B	
Badger Brass Mfg. Co.....	F. C. 1148
Barthel, Daly & Miller.....	1147
Bartholomew Co.....	1147
Benz Auto Import Co.....	1132
Bicycling World & Motorcycle Review	1132
Bosch Magneto Co.....	1091
Bossert Co.....	1142
Bower Roller Bearing Co.....	1142
Bretz, J. S., Co.....	1148
Briggs-Detroit Co.....	1143
Brown-Lipe Gear-Chapin Co.....	1146
Bush Mfg. Co.....	1133

C	
Cartercar Co.....	1145
Century Electric Motor Car Co.....	1142
Champion Ignition Co.....	1148
Champion Spark Plug Co.....	1082
Clark-Carter Automobile Co.....	1144
Classified Advertising.....	1130-31
Colonial Electric Car Co.....	1146
Consolidated Mfg. Co.....	1136
Continental Motor Mfg. Co.....	1133
Covert Motor Vehicle Co.....	1144
Cox Brass Mfg. Co.....	1088
Cramp, Wm. & Sons, Ship & Engine Building Co.....	1141

D	
Dayton Rubber Mfg. Co.....	1131
Dean Electric Co.....	1086
Diamond Rubber Co.....	1139

E	
Electric Welding Products Co.....	1144
Empire Tire Co.....	1139

F	
Fedders Mfg. Wks.....	1135
F. I. A. T.....	1146
Firestone Tire & Rubber Co.....	1144
Fisk Rubber Co.....	1131
Flanders Mfg. Co.....	1126-27
Ford Motor Co.....	1143

G	
Goodyear Tire & Rubber Co.....	1131
Grossman, Emil, Co.....	1131

H	
Hartford Suspension Co.....	1094
Havers Motor Car Co.....	1143
Haynes Automobile Co.....	1145
Henderson Motor Sales Co.....	1146
Hupp Motor Car Co.....	1084
Hyatt Roller Bearing Co.....	1085

I	
Inner Shoe Tire Co.....	1131
International Accessories Corp.....	1136
Inter-State Automobile Co.....	1145
Invincible Starter Co.....	1142

J	
Jackson Automobile Co.....	1143
Jamestown Wheel & Mfg. Co.....	1133
Jeffery-Dewitt Co.....	1144
Jones, Phineas, & Co.....	1141

K	
Kellom, Chas. F., Co.....	1133
Kelly-Springfield Tire Co.....	1137
Kinsey Mfg. Co.....	1134
Kissel Motor Car Co.....	1147
Kline Motor Car Corp.....	1148
Knox Automobile Co.....	1143

L	
Lauth-Juergens Motor Car Co.....	1135
Leather Tire Goods Co.....	1131
Locomobile Co.....	1131
Lovell-McConnell Mfg. Co.....	Inside B. C.

M	
McGraw Tire & Rubber Co.....	1133
McIntyre, W. H., Co.....	1146
Manufacturers and Dealers Motor Fire Insurance Co.....	1081
Marion Sales Co.....	1147
Mayo Radiator Co.....	1083
Metz Co.....	1145
Michelin Tire Co.....	1141
Michigan Buggy Co.....	1147
Michigan Crank Shaft Co.....	1131
Miller, Chas. E.....	1134
Mosler, A. R., & Co.....	1133
Moss Photo Engraving Co.....	1140
Motor Car Equipment Co.....	1133
Motor Truck Body Co.....	1132
Mott Wheel Works.....	1148
Motz Tire & Rubber Co.....	1133

N	
National Motor Vehicle Co.....	1145
New Departure Mfg. Co.....	1092
New Tyr Mfg. Co.....	1083
Nordvke & Marmon.....	Inside F. C.
Not-A-Crank Gas Engine Starter Co	1142

O	
Owen, R. M., & Co.....	1131

P	
Packard Electric Co.....	1141
Parish Mfg. Co.....	1133
Parish & Bingham Co.....	1142
Penn Spring Works.....	1137
Pennsylvania Rubber Co.....	1093
Perfection Spring Co.....	1131
Petrel Motor Car Co.....	1143
Pullman Motor Car Co.....	1143

Q	
Queen Mfg. Co.....	1140

R	
R. C. H. Corporation.....	1145
Remy Electric Co.....	1132
Royal Equipment Co.....	1142

S	
Sackman Mfg. Co.....	1146
Safety Tire Gauge Co.....	1131
Salisbury Wheel & Mfg. Co.....	1139
Schrader's Sons, A., Inc.....	1138
Selden Motor Vehicle Co.....	1147
Shawmut Tire Co.....	1146
Sparks-Withington Co.....	1140
Speedwell Motor Car Co.....	1145
Splitdorf, C. F.....	1148
Springfield Metal Body Co.....	1131
Standard Oil Co.....	1138
Standard Roller Bearing Co.....	1131
Standard Tire Protector Co.....	1131
Stearns, F. B., Co.....	1145
Stewart & Clark Mfg. Co.....	1090

T	
Thomas, E. R., Motor Car Co.....	1087
Timken Detroit Axle Co.....	1089

U	
United Rim Co.....	1141
U. S. Auto Horn Co.....	1142
United States Tire Co.....	1133

V	
Velie Motor Vehicle Co.....	1143

W	
Warner Gear Co.....	1141
Warner Instrument Co.....	1132
Weed Chain Tire Grip Co.....	1133
Western Motor Co.....	1141
Willard Storage Battery Co.....	1133
Willys-Garford Sales Co.....	B. C.
Willys-Overland Co.....	1096
Winton Motor Car Co.....	1147
Wisconsin Motor Mfg. Co.....	1146



1,001,613. Speed Indicator. Walter F. Brown, Worcester, Mass. Filed Sept. 2, 1908. Serial No. 451,325.

1. As a new and improved article of manufacture, a centrifugal force speed indicator having a revolvably mounted head member provided with intercommunicating central and outer chambers for containing a fluid, one or more of the walls of the outer chambers being elastic and exposed to atmospheric pressure on one side and to said fluid on the other, whereby when in use the cubical capacity of the outer fluid-holding chambers is automatically changed by the action of centrifugal force, and means for indicating said changes or variations.

1,001,632. Tire Holder. Frank Sellers Garrett, Wilmington, Del., assignor to himself and Henry Keppele Miller, Wilmington, Del., trading as Garrett, Miller & Co. Original application filed Apr. 19, 1910, Serial No. 556,376. Divided and this application filed Aug. 6, 1910. Serial No. 575,913.

1. In a tire holder, a two-section guide, a rod upon which one section is loosely mounted, and means to fixedly secure the other section to the rod and a single strap passing through both guide sections and adapted to pass around the tire.

1,001,670. Automobile Tire Tool. George A. Morris, Rome, Ga., assignor or three-tenths to Sharp & Sharp, a Partnership, three-tenths to G. J. Davis, and one-tenth to J. P. Swinford, Rome, Ga. Filed May 18, 1911. Serial No. 627,945.

1. In a tire tool, a hooked member having a shank provided with recesses, a handle having a pivotal bolt to enter the recesses of the shank, a link pivoted to the handle, said link having a head thereon with a concaved face, and a post adjustable on the shank.

1,001,673. Roller Bearing. John Newmann, Brooklyn, N. Y. Filed Jan. 18, 1911. Serial No. 603,226.

1. In a roller bearing of the character described, individual loose blocks, each having an outer extension, the lateral surfaces of the blocks and the extensions being concaved.

1,001,686. Resilient Wheel. Giuseppe Restucci, Naples, Italy, assignor of one-half to Thomas P. Pugliatti, Naples, Italy. Filed May 5, 1910. Serial No. 559,623.

1. In a vehicle wheel, in combination, a road-engaging portion, a hub portion, an annular spring surrounding the periphery of the hub portion and supporting the same within the loop comprising the lower part thereof, and supporting devices on the road-engaging portion for supporting the said spring by the loop comprising the upper part thereof.

1,001,708. Clutch. Martin W. Thompson, Hammond, Ind. Filed Nov. 5, 1910. Serial No. 590,792.

1. In a clutch, the combination with a rotatable member having a concentric groove, of a pair of clutch members adjacent said plate, jaws on said members adapted to frictionally engage the walls of

said groove, a link pivotally connecting said clutch members, a spring adapted to retain the said members in inoperative position, and means for operating said jaws, said means comprising a rotating member, and a projection thereon engaging said link.

1,001,714. Resilient Wheel. Enos A. Wall, Salt Lake City, Utah. Filed Feb. 25, 1911. Serial No. 610,905.

1. A resilient wheel comprising a hub and its connected metallic felly provided with apertures, the outer tire-carrying rim provided on its inner side with a series of cups having central studs or posts, tubular springs seated at their outer ends in said cups with the studs entering their bores, centrally apertured cups fitting the inner ends of the springs, radial bolts extending through the felly apertures and through the apertured cups into the bores of the springs, nuts on the bolts at the inner and outer faces of the felly and a nut on every bolt against the outer face of the apertured cup; the ends of the bolts and rim-studs or posts being spaced apart and disconnected to allow the springs to yield laterally, as well as longitudinally.

1,001,715. Spring Wheel. Enos A. Wall, Salt Lake City, Utah. Filed Mar. 8, 1911. Serial No. 613,036.

A resilient wheel comprising a rim, an outer sectional rim formed of a circular series of socketed plates, springs transversely coiled between their ends and connected at their opposite diverging ends to the inner wheel member and opposite ends of the said plates, respectively; a pair of such springs to every outer section with their coils extending parallel to the axle of the wheel and in horizontal alignment, and a rubber tire carried by the said sections and having studs entering said sockets.

1,001,753. Wheel Structure. Manning Goldsmith, Decatur, Ga. Filed Feb. 23, 1911. Serial No. 610,176.

1. In a wheel structure, an inner wheel, an outer casing surrounding the inner wheel, a pneumatic tire disposed between the inner wheel and outer casing, and a plurality of members disposed entirely within and pivotally connected with the sides of said outer casing, to hold said sides in their proper spaced relation and to be adapted for swinging movement into and out of engagement with the periphery of the inner wheel, to rigidly lock said inner wheel and outer casing and release the same, respectively.

1,001,764. Antifriction Bearing. Robert Linn, Chicago, Ill. Filed May 16, 1908. Serial No. 433,283.

1. In a bearing, the combination of a grooved shaft, balls adapted to engage with said grooves, spacing balls interposed between said first-named balls for holding the same apart, each of said spacing balls engaging with four of said first-named balls, a floating ring engaging with said spacing balls, a casing or hub having an inwardly-projecting shoulder, bearing rings secured in said casing and resting against said shoulder, and adjustable bearing rings also secured in said casing and adapted to coact with said first-named bearing rings to form a support for said casing on said balls.

1,001,802. Demountable Rim. John Baker, Pasadena, Cal. Filed July 21, 1910. Serial No. 573,108.

1. A fixed rim, a demountable rim thereon, a plurality of eccentric locking lugs ro-

tatably mounted on the fixed rim, and a series of fixed lugs on the demountable rim located concentric with the axes of the rotatable lugs, whereby said rotatable lugs may be moved into positions on either side of the fixed lugs on the demountable rim to either lock or unlock the demountable rim.

1,001,830. Phonographic Automobile Alarm. Joseph H. Erickson, San Francisco, Cal. Filed Oct. 24, 1910. Serial No. 588,643.

1. A phonographic automobile alarm comprising a revoluble record, a sound box and stylus and amplifying horn, controllable means to mechanically engage and disengage the stylus and record, said means comprising a movable support for normally maintaining the stylus out of engagement with the record, a spring pressed member engaging the said support and holding it in an elevated position, and means for moving said member to allow the stylus to engage the record, a driving element, and a transmitting mechanism between said element and the record, and movable into engagement with the driving element substantially simultaneously with the engagement of the stylus with the record.

1,001,837. Motor Vehicle. Rodolphus Fuller, Detroit, Mich. Filed July 27, 1908. Serial No. 445,641.

1. In a truck for motor vehicles, the combination of a fixed axle, driving wheels on said axle, a truck frame, springs on the axle supporting the truck frame, a motor for each wheel, a casing for each motor, a plurality of hangers for each casing pivotally attached to the frame at their upper ends, two of said hangers being pivotally connected at their lower ends to each casing at one side thereof and another of said hangers being pivotally connected at its lower end to the casing of each motor at the opposite side of said casing, said hangers forming a three-point suspension for each motor, a countershaft carried by each motor casing, gears connecting said shaft and motor, sprockets on said shafts and vehicle wheels, and sprocket chains engaging said sprockets.

1,001,847. Carburetter. John O. Hobbs, Chicago, Ill. Filed Feb. 1, 1907. Serial No. 355,267.

1. In a carburetter, an adjustable valve for regulating the size of the hydrocarbon outlet, means for adjusting said valve, said valve in one adjustment operating to increase the size of the hydrocarbon outlet upon an increase in the speed of the engine, and in another adjustment operating to decrease the size of the hydrocarbon outlet upon an increase in the speed of the engine.

1,001,907. Vehicle Wheel. Charles Ulmer, Lisbon, N. D. Filed Feb. 4, 1911. Serial No. 606,596.

In a vehicle wheel, a hub having a circumscribing groove, an annulus formed in its inner side with a groove, a pneumatic cushion arranged between the hub and annulus fitting in the groove, the annulus having lateral threaded flanges, the flanges being formed with radial slots, hub plates threaded upon the extensions and having radiating arms working in the slots in the annulus, the arms being secured removably to the hub radially beyond the extensions thereof, clamping rings threaded upon the flanges, one to each flange and confining the arms in the said slots, spokes radiating from the annulus, and a rim supported at the outer ends of the spokes.

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in the march of progress denote advancement and we who wish to keep abreast the times must certainly keep alive to the ever changing situations. Otherwise we may soon be burdened with proverbial

MILLSTONES.

This is particularly true in respect to the purchase of automobiles and many hundreds of people annually suffer the consequences of ill-advised purchases from firms that engage in re-selling cars that never should have been on the market. The moral is

INVESTIGATE

for yourself very carefully before you buy a car, and especially a second-hand car. It will no doubt interest you to learn what else we may have to say on this subject. If so, write E. R. THOMAS MOTOR CAR CO., 1200 Niagara Street, Buffalo, N. Y.

CORBIN 1910 Roadster, 2, 3, or 4-passenger; Warner autometer, clock; run only 3,700 miles; looks like new; \$1000. A. S. LEE, 52 Richmond St., Providence, R. I.

FOR SALE—5-passenger body, \$30.00; top, \$15.00; treads, 30 x 3½, \$3.50; frame, \$6.00; all kinds of repairs for Reo and Rambler cars at from one-half to one-fifth of the list price; also new and second-hand cars for sale. SCHISSEL AUTO CO., Cherokee, Iowa.

BRAND NEW TAXICABS, never used, 4-cyl., 30 H. P., Bosch mag., shaft drive, left steer, leather upholstered; cost new \$3,000 each; for quick sale, \$1,350 each. Write for photo. EDGEWATER GARAGE, 5129 Evanston Ave., Chicago, Ill.

AUTOMOBILE WANTED—Will accept auto as part payment on one of our Wenatchee, Wash., orchard tracts; 5 acres; worth \$3,000. Address 417, 112 W. Adams St., Chicago, Ill.

NEW LANDAULET—Palmer-Singer drop frame town car, 30 H. P., 4-cyl., late 1909 model, never used; excellent bargain; would make excellent taxicab. BOX 458, care Motor World.

WANTED—1911 Marion Bob Cat in good condition, state particulars. WM. J. COFFEY, 1072 Bedford Ave., Brooklyn, N. Y.

POPE-HARTFORD, 50 H. P., practically new 1911 model, 5-passenger touring car, fully and completely equipped, many accessories, absolutely in perfect condition in every way, not a scratch on it, purchased new in August and run very little during fall by owner only. M. E. LAFFERTY, 25 Park Place, New York.

FOR SALE—Pierce-Arrow car, seven seats, fully equipped, late 1911 model, price \$4,000; as good as new, varnish not even scratched. W. F. O'CONNOR, Tariffville, Conn.

RENOVATOR for automobiles, carriages, wagons, etc.—and any painted or varnished surface. Nothing better for curtains or tops. Directions: Shake well, moisten small piece of cotton cloth with the Renovator and apply by slightly rubbing over the surface to be cleaned, and then wipe off with a clean cloth. Result will be as newly varnished and you will be delighted. Price, 25 cents. Agents wanted. Manufactured by J. C. MONROE, Darby, Philadelphia.

AUCTION SALE—One Second-hand 1911 Alco 5-ton Truck Chassis—At Twenty-fifth Street Garage, 24th St. and 11th Ave., in the City of New York, N. Y., on Wednesday, March 20th, 1912, at 10 o'clock A. M., the undersigned will offer for sale, and sell at public auction to the highest bidder for cash, one second-hand 1911 Alco 5-ton truck chassis for the account of J. A. Costa, 296 Washington St., New York City, N. Y. This chassis may be inspected at any time at the place of sale. AMERICAN LOCOMOTIVE COMPANY, 30 Church St., New York City.

HAVE a buyer for a good 1911 or 1912 auto in perfect shape; he will give his personal mortgage on good property for same at 6%. GEO. B. CLARK, Milford, Conn.

MAILING LISTS of Automobile Owners. S. H. CARROLL, JR., Albany, N. Y.

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FOR SALE—7-Passenger Touring Car, fully equipped; first-class condition. 1910 model; will sacrifice for \$1,000; cost \$4,000. 1911 Cadillac, thoroughly overhauled; fully equipped; no reasonable offer refused. 1910 Marion, in first-class condition; fully equipped; very cheap if sold immediately. 1911 Marion 5-passenger, good as new; only run 5,000 miles; very cheap. Inquire at RIVERSIDE GARAGE, 7-9 Paterson St., Paterson, N. J.

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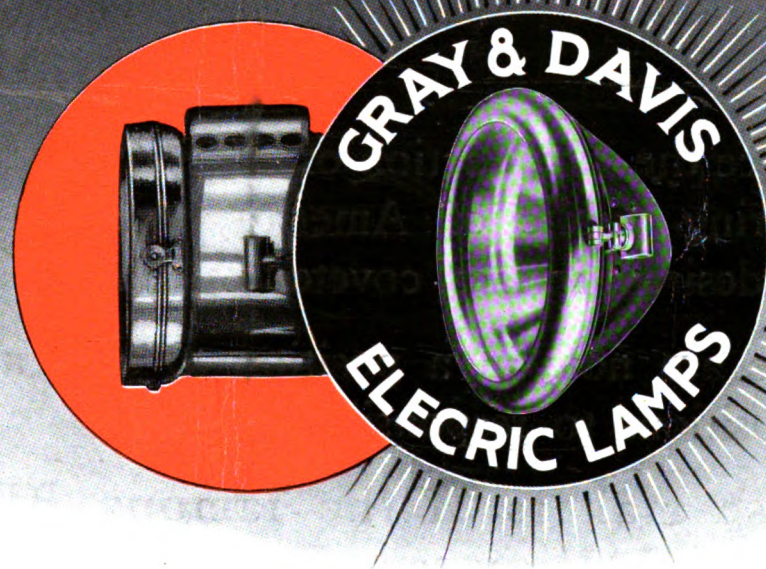
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No. 13

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THE ECLIPSE



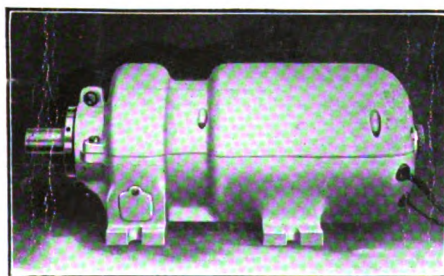
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THE MOTOR WORLD

Vol. XXX New York, U. S. A., Thursday, March 21, 1912. No. 13

GOODRICH TO CUT ANOTHER MELON

Big Rubber Company to Become New York Corporation with \$45,000,000 Capital—Rich Rewards for Stockholders.

Despite the fact that within the past sixteen months the B. F. Goodrich Co., of Akron, Ohio, has cut two choice "melons," the last one amounting to a 20 per cent. dividend on its common stock, payable in preferred shares, rumors that still another "melon" is ready for carving were confirmed this week, when it was made known that the big Akron company will increase its capital from \$20,000,000 to \$45,000,000, and relinquish its Ohio charter for one taken out under New York laws. As a result of the proceedings, the common stockholders will receive not only nearly 3 for 1 of the new shares, but also a 78 per cent. cash dividend. A special meeting, at which these several things will be brought about, will be held on Wednesday next, 27th inst.

It undoubtedly was due to unripe or garbled reports of these intentions on the part of the Goodrich company that gave rise to rumors on the Chicago stock market that it contemplated entering a merger of some sort, which reports, however, have been authoritatively and positively denied.

Of the present Goodrich \$20,000,000 capital \$10,000,000 is common stock, all of which is outstanding, and \$6,000,000 of the \$10,000,000 issue of 7 per cent. cumulative preferred stock authorized is outstanding. The New York corporation will have \$30,000,000 common stock and \$15,000,000 of preferred, which probably will be listed on listed on the New York Stock Exchange.

Holders of the preferred stock will receive new preferred at the rate of 120, or the bankers who have underwritten the new capitalization will pay cash for their holdings at that rate. The common stockholders will receive 2 7/10 shares of new stock for each share held, and a 78 per cent. cash dividend, with the option of selling their new stock at \$67.50. The present

common stock pays 12 per cent. and the increased issue, it is estimated, will pay at the rate of 4 per cent.

Goldman, Sachs & Co. and Lehman Bros., of New York, and Kleinwort Sons & Co., of London, are understood to have underwritten the new issues.

Appeal in Nobby Tread Case Advanced.

On a motion made by the attorneys for the Republic Rubber Co., of Youngstown, Ohio, in the appeal of Morgan & Wright, of Detroit, Mich., from the decision of Judge Lacombe, in the United States District Court for the Southern District of New York, holding the Nobby Tread tire to be an infringement of the Tod patent, No. 898,907, on staggered treads, the case has been advanced on the calendar and argument has been set for the first week in April, in the United States Circuit Court of Appeals for the Second Circuit. The patent litigation began early last year and came to trial on Monday, October 19, 1911. Pending the disposal of the appeal the injunction granted by Justice Lacombe was suspended.

Pope to Enlarge and Add New Model.

In order to further extend its plant in Hartford, Conn., to provide for the production of a new four-cylinder model which will list at \$2,000, the Pope Mfg. Co. has floated a million-dollar loan, which sum has been taken care of by Bond & Goodwin, of Boston. The notes, which will mature in two years, carry 6 per cent. interest. The addition to the Pope plant will provide about 60,000 square feet of floor space, and will represent a cost of about \$200,000.

General Motors Changes Interest Date.

The semi-annual 3½ per cent. dividend on the preferred shares of the General Motors Co., which hitherto has been paid on April 1st, hereafter will become due a month later owing to the fact that interest on the \$15,000,000 note issue is payable April 1st. The new arrangement will, it is stated, enable the company to conserve its working capital and to collect an additional month's receipts at a favorable time.

WORLD'S EXPORTS OVER \$86,000,000

France Leads Automobile Exporting Nations But Barely Holds Its Own—America Makes Greatest Advance.

France's figures finally having become available, it has been made possible to reckon the value of the world's exportation of automobiles and parts thereof; or, at any rate, of the four leading automobile exporting countries. The total value of their foreign business during the year 1911 amounted to \$86,974,645, as compared with \$73,602,694 during the preceding year.

Each of the four countries—France, United States, Germany and Great Britain—increased its foreign trade, and while France continues to lead the world in respect to the volume of exports its percentage of increase fell to almost nothing; its export business barely held its own. The United States, on the other hand, made by far the greatest gains, its total increase amounting to 45 per cent.

While Italy, Spain, Austria, Belgium and Switzerland also figure as automobile exporting nations, their shipments, while substantial, are comparatively small when contrasted with the exports of the four greater countries. Their respective figures are not available, but it is doubtful if the combined sum would add \$5,000,000 to the grand total.

Tabulated, the exports of France, United States, Germany and Great Britain are as follows:

Country.	1910.	1911.	Per Ct. Gain.
France.	\$35,027,763	\$35,286,576	.75
United States	13,190,296	19,178,484	45.00
Germany....	12,356,000	16,581,000	34.20
Great Britain.	13,028,635	15,928,585	22.95
Total.....	\$73,602,694	\$86,974,645	

While the gains made by the United States are remarkable, the retrogression of France is even more noticeable, and the manner in which it occurred is almost inexplicable. Up to and including June, the

French statistics indicated that the overseas republic was still striding upward, its gain at that time being fully 16 per cent. During the last six months of the year, however, a slumpish movement set in, and the exports fell off so rapidly that the advantage gained during the first half of the year was almost wiped out; in fact, but for a show of renewed strength during the month of December, France must have shown a net loss.

Its chief customers were Great Britain, which took cars and parts to the value of \$10,635,072, and Belgium, which took \$7,264,906. The former represents a loss of \$3,000,000, and the latter a gain of \$1,000,000. Germany purchased French cars to the value of \$2,854,407, an increase of but \$200,000. Only two other countries, Switzerland and Brazil, passed the million-dollar mark, the former taking \$1,129,822, as against \$960,368, and Brazil \$1,584,916, as against \$514,924. Although a French possession, Algiers is included in the French statistics, its purchases also reaching into seven figures and having increased from \$1,831,763 to \$2,664,172. In the case of the United States' shipments, its insular possessions are not included in its export tables, else the figures would be increased by more than \$1,000,000.

Of the French exports, \$1,362,966 represents commercial vehicles, an increase of \$400,000.

Receiver's Figures on Wyckoff Failure.

John S. Shepard, Jr., receiver for Wyckoff, Church & Partridge, Inc., of New York, makers of Commer trucks and Guy Vaughn cars, has obtained an order from the United States court to issue \$20,000 in receiver's certificates to keep the business going and to pay wages due, which amount to \$8,000.

The certificates are payable three months after date and are issued subject to mortgage on the leasehold of 56th street and Broadway, \$200,000, and mortgage on the factory at Kingston, \$50,000. The receiver has ascertained that the liabilities are \$650,000, of which \$250,000 is secured by mortgages, and assets are estimated at \$582,000, consisting of leasehold \$200,000, equity in factory in Kingston, N. Y., \$175,000, outstanding accounts \$50,000, supplies \$30,000, automobiles in process of manufacture \$55,000, foreign automobiles \$27,000, other assets \$35,000 and bills receivable \$10,000.

Among other developments of the Wyckoff, Church & Partridge failure, it transpires that the Stearns Auto Repair Co., of New York, which was sued by the United States government for \$10,000 for failure to file its annual statement, is also an outgrowth of the Wyckoff, Church & Partridge business during the period when that firm handled the Stearns car in New York and before they engaged in the manufacturing business. The F. B. Stearns Co. is in no way related to the repair company which bears that name.

DAILY NEWSPAPER SUES PANHARD

Wants \$6,663 Damages for Alleged "Misrepresentation of Facts"—Jury Will Decide on Vintage of Cars.

For the past five days there has been on trial in the United States District Court for the Southern District of New York, in the Post Office building, a damage suit which is not without complexities. It hinges upon the point whether or not the commercial motor vehicles turned out by the Societe Anonyme des Anciens Etablissements Panhard & Levassor in 1910 differ in essential mechanical details from those manufactured in 1909. The Interborough News Delivery Co., which is the plaintiff in the case, says they do differ; and the Panhard people say they don't. The deadlock in the two opinions having existed for some time, it is now up to Judge Mayer and a jury to decide who is right.

According to the complaint, the News company, which is a subsidiary of the New York Globe, an evening newspaper, in 1910 purchased two two-ton trucks for rapid newspaper delivery within the city limits, and specified 1910 models. In due course the trucks were delivered, and after they had been in use for some time it was discovered that they did not work as well as expected. The complaint holds that an examination of the trucks in the hands of experts proved that they were of 1909 vintage, having old-style motors and centrifugal pumps, instead of gear-driven pumps, and evincing other divergencies from the 1910 models.

Considering itself damaged by this alleged "misrepresentation of facts," the News company brought suit in the New York Supreme Court for \$6,663.42, plus interest and costs. On motion of the defendant automobile company, however, the action was transferred to the Federal courts, which accounts for its presence in the Federal building. During the trial experts and near-experts were called by the warring parties, and if the jurors understood one-half of the technical terms with which these experts filled the court room they certainly did not show it. When, however, one of the witnesses testified that he had been employed by the Economical Garage, in New York City, they joined heartily in the laugh started by Judge Mayer, who jocularly remarked: "I didn't think there existed such a thing as an economical garage in New York."

The Panhard agents filed a counter claim for repairs made on the trucks, but this claim was dismissed by Judge Mayer, and the remainder of the case still is on.

Harry Grant Forms a Truck Company.

Harry F. Grant, the former Alco pilot, who twice won the Vanderbilt Cup and

recently established himself in Boston, has gone a step further and organized the Grant Motor Truck Co., which is located in Cambridge, across the river from Boston. Associated with Grant, who is treasurer of the company, is Frank S. Corlew, who will act as sales manager. A one-ton vehicle will be built. Temporary offices in Cambridge have been established in the Shoe and Leather Building.

Consolidated Rubber to Pay 4 Per Cent.

For the first time in its history the Consolidated Rubber Tire Co. will pay the full rate of interest, 4 per cent., on its issue of \$2,850,500 debenture income bonds, which interest falls due on April 1st. The highest rate previously paid on the bonds was 3½ per cent., in 1909. As a result of the expected full payment, the bonds have advanced to the highest price on record, which rise has carried along both common and preferred stock, although the latter, which is a cumulative issue, has not paid a dividend since 1900. The overdue dividends amount to 72 per cent.

Cincinnati Truck Property Changes Hands.

The drawings, patents, equipment and material belonging to what was known as the Power Car Co., of Cincinnati, have been purchased by Franklin Alter, Harry T. Alter and J. B. Doan, of that city, who have organized the Cincinnati Motors Co., which shortly will be incorporated and which proposes to manufacture and market a truck developed by the Power Car Co., but which never reached far beyond the developing stage. Temporarily the new company will be located in Cincinnati, at 1741-43 Central avenue.

New Jersey Supply Dealers Organizing.

The New Jersey Auto Supply Trade Association was tentatively organized by the accessory dealers in Newark last week, and will reach out in the endeavor to include in its membership all supply houses in the State. Marcus Allen is temporary chairman of the organization, and F. C. Braden temporary secretary. The chief object of the association is the establishment of a credit interchange bureau, which will protect its members from poor payers and worse debts.

Detroit Castings Company Dissolves.

The United States Motor Castings Co., formerly at 907 Michigan avenue, Detroit, Mich., has filed notice of dissolution. Its business, good will and assets have been purchased by the Monarch Brass Co., which will continue the business at the old location.

Case Takes Up the Six-Cylinder Model.

The J. I. Case Co., Racine, Wis., has a six-cylinder car "in the works." It will be tried out in competition during the present year and almost certainly will be added to the Case line for 1913.

STUDEBAKER FLOATS NOTE ISSUE

Eight Millions on Ten Years' Series Offered to the Public—Conditions That Govern the Sale.

Goldman, Sachs & Co. and Lehman Bros., the New York banking firms, who, in cooperation with Kleinwort, Sons & Co., of London, financed the \$45,000,000 Studebaker Corporation in January of last year, when the several Studebaker activities were merged under that title, and who engineered the sale of \$13,500,000 preferred stock which was issued, are now offering to the public a Studebaker issue of \$8,000,000. The notes, which bear 5 per cent. interest, will be issued in series of \$400,000 each, maturing September 1st and March 1st of each year until 1922, the average maturity being 5¼ years.

The bankers state that the greater portion of the issue has been sold, and they offer the remainder at 98 and interest, which yields better than 5.40 per cent. Purchasers, however, are not offered any option in the matter of short term and long term notes, as the condition of sales require that each buyer purchase an equal amount of each maturity. The notes are redeemable as a whole, but not in part, on any interest date, at thirty days' notice, at 101½ and interest.

The Studebaker Corporation has no funded debt other than these notes, the proceeds of which will be used toward liquidating the floating debt.

The prospectus offering the notes for sale is accompanied by a statement from Clement Studebaker, Jr., vice-president of the Studebaker Corporation, who certifies that "the earnings of the company for the year 1911, applicable to interest charges, were in excess of \$2,500,000," and that the "business since January 1, 1912, is greatly in excess of 1911, the actual orders in hand for the current year pointing to materially increased profits."

The trustee agreement with the Columbia Trust Co., of New York, under which the notes are issued, provides that the company shall at all times maintain its cash and quick assets at an amount at least equal to 175 per cent. of its liabilities and indebtedness, secured and unsecured, including the present note issue.

Carter Completes Washington Company.

A. Gary Carter, head of the embarrassed Carter Motor Car Corporation, has completed the organization of the Washington Motor Car Corporation, which will fall heir to the business of its much-troubled predecessor and take over its factory in Hyattsville, Md., which is practically a suburb of the capital. Carter himself is president of the new company, which has a truly formidable list of vice-presidents and

directors. They are as follows: W. D. Arrison, first vice-president; J. D. Darnall, second vice-president; P. M. Galvin, third vice-president; Ralph Bricker, fourth vice-president; W. P. Magruder, fifth vice-president; Dr. John R. Sharp, sixth vice-president; Lewis S. Kann, treasurer; Dr. Thomas E. Latimer, assistant treasurer; C. C. Gove, secretary; J. F. Lillard, assistant secretary; Frank L. Carter, general manager, and H. O. Carter, advertising manager.

The directors are as follows: Lewis S. Kann, J. D. Darnall, W. D. Barry, Major C. Fred Cook, W. W. Price, Hugh F. Harvey, Dr. John R. Sharp, Thomas F. Murray, W. L. Bowles, Dr. H. M. Dixon, P. M. Galvin, Ralph Bricker, Charles J. Cassidy, J. C. Wineman, J. H. Ontrich, Daniel Levy, W. H. Hill, E. B. Terry, W. P. Magruder, Dr. T. E. Latimer, Dr. Guy Latimer, J. F. Lillard, Hyman Brown, Dr. E. A. Gorman, Dr. A. V. Parsons, Samuel Gassenheimer, Charles F. Ruppert, C. C. Gove, W. D. Arrison, A. Gary Carter, Frank L. Carter, W. Shirley Carter, H. O. Carter and A. L. Cline.

The manufacture of what was the Washington car will be continued, but henceforth it will be styled the Hyattsville Special. The manufacture of light and heavy trucks also will be taken up.

Death Claims Buffalo Engine Manufacturer.

Abraham Snyder, the founder and secretary-treasurer of the Buffalo Gasolene Motor Co., of Buffalo, N. Y., on Tuesday, 12th inst., succumbed to heart disease with which he had long been afflicted. Snyder was born in Canada in 1845 and removed to Buffalo in 1869, where he was successively engaged in the drygoods and boot and shoe business before engaging in the manufacture of gasolene engines in 1899.

To Make Carbureters in Nebraska City.

Ralph A. Duff, of Nebraska City, Neb., who is an inventor with means, has devised a two-cycle engine and carburetter, among other things, and is making ready to place them on the market. He has in hand plans for the erection of a factory in Nebraska City and is credited with stating that he has sufficient orders for his carburetter to keep him busy for a year.

Two Depots for International Trucks.

The International Motor Co., which markets the Mack, Saurer and Hewitt trucks, has established branches in Cleveland, Ohio, and Atlanta, Ga. The establishment in the former city, which is in charge of J. Charles Ross, is located at 1621 Walnut avenue, N. E. The Atlanta office is located in the Candler Building.

Watson to Build Taxicabs in Flushing.

The Watson Engineering Co., of New York, has leased a part of what is known as the old Bogart factory on Lawrence street, in Flushing, L. I., where it will devote itself to the production of taxicabs.

EVER-READY'S APPEAL IS DENIED

Court Refuses to Stay Injunction Obtained by Klaxon—Characterizes Ever-Ready Horn in Strong Terms.

Ice-cold comfort was obtained by the American Ever-Ready Co., of New York, as a result of its effort to stay the preliminary injunction secured by the Lovell-McConnell Mfg. Co., of Newark, N. J., restraining it from making, selling or in any way having to do with a horn so similar in appearance to the Klaxon "as to deceive or capable of deceiving any person or persons."

This injunction, which was granted by Judge Hough, in the United States District Court for the Southern District of New York, also contained a much broader clause restraining "any article of manufacture or horn embodying the characteristic right angle construction of the horn manufactured by the Lovell-McConnell Mfg. Co.," the unusual breadth and effectiveness of which served to create no little comment in the legal profession and to attach more than usual interest to the appeal to the United States Circuit Court of Appeals for the Second District, which appeal was decided adversely to the Ever-Ready Company on Friday last, 15th inst., when the court characterized the Ever-Ready horn as a "manifest imitation."

The proceeding marked the acute stage of the litigation between the two companies which, as stated in the last issue of the Motor World, involved several unusual charges and was marked by but thinly disguised embitterment on the part of the American Ever-Ready Co. In fact, it transpires that the embittered charges against the Klaxon people and their attorney were merely a part of the vain attempt made some months ago by the Ever-Ready company to stave off the preliminary injunction which was granted at that time by Judge Hough, after a full hearing of the charges referred to.

The appeal of the Ever-Ready company from Judge Hough's judgment was heard by Judges Lacombe, Coxe and Ward, the opinion, which strengthens the Klaxon position, being written by Judge Lacombe. It is as follows:

"This cause closely resembles *Rushmore vs. Manhattan Works*, 163 F. R., 939, where this court considered a case of unfair competition in the sale of automobile lamps; the case at bar is concerned with automobile horns. The resemblance between complainant's and defendant's horns is very great; it is difficult to tell one from the other without an inspection so close as to read the inscription on the name plates. Under the principles of the *Rushmore* decision such a manifest imitation in details of construction, with the consequent likeli-

hood of confusion, should be prevented unless the points of resemblance are the necessary result of an effort to comply with the physical requirements essential to commercial success. A majority of the court are not persuaded that the close resemblance between the two horns results from such an effort. The most characteristic feature is the 'right-angled construction' referred to in the order. Possibly at final hearing defendant may be able to show that a commercially successful power driven horn of this general type could not be made unless the shaft which transmits the power is at right angles to the axis of the horn. But the record before the District Judge did not establish that proposition sufficiently to excuse the adoption of this feature of construction, which, probably more than any other single feature, makes the appearance of the two horns so nearly alike. In the opinion of the majority of the court, the order for preliminary injunction should be affirmed.

This decision was rendered in the suit involving the Lovell-McConnell Mfg. Co.'s design patents Nos. 39,785 and 39,801, in which infringement was joined with a charge of unfair competition.

There are two other suits pending, based on the five basic Klaxon patents, Nos. 923,048, 923,049, 923,122, 958,161 and 956,898, but they do not contain any unusual charges, and the charge of unfair competition being unnecessary and technically objectionable, it has been eliminated from the bill of complaint. The answers to these suits are of the usual stereotyped form, and set up only a small part of the patents from the prior art.

Changes Among Prominent Tradesmen.

R. C. Hoffman has been appointed chief of the engineering department of the Beaver Mfg. Co., Milwaukee, maker of the Beaver motor.

J. P. Lavigne, chief engineer of the Lavigne Gear Co., of Detroit, has resigned that office and retired from the company. He has not yet announced his future plans.

T. J. Hillis has been appointed manager of the Goodyear Tire and Rubber Co.'s Seattle branch. Previously he was in turn connected with the Goodyear depots in Indianapolis and San Francisco.

C. W. Jacoby, former sales manager for the Babcock Electric Co., of Buffalo, has been added to the sales staff of the Standard Electric Car Co., of Jackson, Mich., maker of the Standard electric.

Fred E. Bradfield, who previously was connected with the Velie branch in Chicago, has been appointed manager of the Velie Motor Vehicle Co.'s depot in Boston, Mass. He succeeds Harold Bornstein.

C. W. Martin, manager of the Goodyear branch in Atlanta, Ga., has been called to the factory at Akron, Ohio, where he has assumed charge of the truck tire department. The vacancy at Atlanta caused by

his promotion has been filled by the appointment of H. E. Hyde, Martin's former chief assistant in that city.

H. A. Daniel, formerly purchasing agent of the Carter Car Co., of Pontiac, Mich., has been added to the staff of the Castle Lamp Co., of Amesbury, Mass. He will, however, make his headquarters in Detroit.

W. D. Edenburn has been appointed publicity and assistant advertising manager for the Remy Electric Co., of Anderson, Ind. Previously he was the automobile editor of one of the Indianapolis dailies.

J. C. Braden, manager of the Newark (N. J.) branch of the Diamond Rubber Co., has resigned that office to enter the service of the Swinehart Tire & Rubber Co. He will be attached to the sales department.

John L. Bender has been elected vice-president and assistant general manager of the Croxton Motor Co., of Cleveland. Formerly he was associated with the American Ball Bearing Co., of the same city, and has had long experience in the automobile industry.

Herbert E. Maslin has been elected vice-president and general manager of the Standard Motor Car Co., of San Francisco, which handles the Stoddard-Dayton, and of which W. L. Hughson is president. For 25 years, until a month ago, Maslin was a member of E. C. Stearns & Co., of Syracuse, N. Y., makers of hardware and typewriters, and, during the heyday of the bicycle, of the Stearns bicycle, during which time Maslin was almost a national figure in that industry.

Big Taxicab Business to Be Sold.

Because, according to a statement which has been issued by R. W. Meade, who is president and general manager of the New York Transportation Co., the business of one of its subsidiaries, the Fifth Avenue Coach Co., "has grown with amazing rapidity," it is likely that the big company's immense taxicab business—cabs, plant, equipment and all—will be disposed of. The sale has been unanimously recommended by the directors of the company, it is said, and a special meeting of the stockholders has been called for Monday next, 25th inst., when it is practically certain to be ratified. The purpose of the sale, it is explained, is to permit greater concentration in developing the business of the Fifth Avenue Coach Co., though none of the other subsidiaries involved—the Metropolitan Express Co. and the Park Carriage Co.—will be disturbed or disposed of. Nothing could be learned of the prospective purchasers of the taxicab business, nor of the plans of the New York Transportation Co. for the improvement of the Fifth avenue 'bus service. Meade, who ordinarily is a most approachable man, willing to talk, being persistently "out" to all newspaper men. It is rumored, however, that a merger

of the taxicab business with that of the Connecticut Cab Co. and the Cab and Taxi Co., with Paul Rainey, the wealthy sportsman, as the moving spirit, is in progress. and though officials of the companies refused to deny the rumors, no information of a definite nature can be obtained.

Twyford Reorganizes in Houston.

The Twyford Auto Mfg. Co., which several months since removed from San Antonio to Houston, Tex., and which purposes manufacturing trucks under the Twyford four-wheel drive patent, has completed its reorganization and acquired a site of 30 acres in South Houston, on which a modern machine shop with concrete floor already is located. R. E. Twyford, the patentee, will be superintendent of the plant. The officers of the reorganized company, which is capitalized at \$400,000, are as follows: Monta J. Moore, president; J. N. Groesbeck, vice-president; Monta J. Moore, Jr., secretary and treasurer.

Taxicab Company Declared Not Bankrupt.

Acting upon the report of W. H. Willis, referee in bankruptcy in the case of the Central Park Taxicab Co., 145 W. 110th street, New York City, Judge Holt, in the United States District Court, on Monday last, 11th inst., dismissed the petition in involuntary bankruptcy filed against the company on April 11, 1911. The motion for the dismissal of the petition was made by Leonard Bronner, acting for the company, and was supported by the referee, who declared that no proofs had been offered before him supporting the allegations made in the bankruptcy petition that had been filed.

Gets American Car for Entire Island.

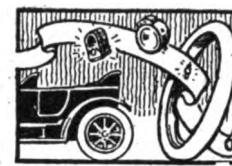
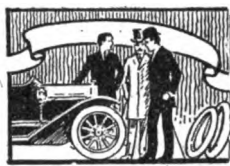
R. Fulton Chotworth, a wealthy resident of Port au Spain, Trinidad, has secured the agency for the Simplex car for that island. When Chotworth first began dickering with the Simplex company he had no intention of engaging in the export business, but the opening offered was one which he could not resist.

Loses a Wilson, but Gains a Warren.

Homer Warren, president of the Warren Motor Car Co., has been elected president of the Detroit Chamber of Commerce for the ensuing year. It is somewhat of a coincidence that Lucius E. Wilson has just relinquished the secretaryship of the same organization to become general manager of the Warren company.

Canadians Get American Carburetter.

Findeisen & Kropf Mfg. Co., makers of the Rayfield carburetter, have appointed the Hall Motor Supplies Co., of Toronto, its Canadian distributor. The Hall company is the most recent addition to the Canadian trade and handles a number of American automobile specialties.



Frank McAndrew is building a garage in Glencoe, Minn.

E. P. Bennett has opened a garage and supply store in Elliott, Ia.

E. S. Saube has purchased the George Allen Garage at Chichico, Cal.

John Christiansen is making ready to open a garage and repair shop in Rollette, N. D.

Harry C. Herrmans is building a concrete garage on Eighth street, Hoquiam, Wash.

The Pacific Auto Co. has commenced business in Eugene, Ore., with Ford and Auburn cars as their leaders.

R. S. Jennings has opened salesrooms in New London, Wis., where he will show Studebaker and Cadillac cars.

Wayne Schwab and Homer F. Keyes have formed a partnership and opened a supply store in Sacramento, Cal.

Kilby & Barrett have opened a salesroom at 28 High street, Hartford, Conn. They handle Matheson and Jackson cars.

For a consideration of \$6,000, A. E. Thompson has purchased the interest of S. P. Lemmon in the Augusta (Ill.) Automobile Co.

Frank P. Beck has taken the agency for E-M-F and Flanders cars in Marion, Ohio, and established his headquarters in the Cadillac Garage.

The La Salle Auto Sales Co. has opened salesrooms at 2031 Michigan avenue, Chicago, Ill. It will make a specialty of dealing in second-hand cars.

W. E. Sammons and W. T. Dove have opened an automobile repair shop at the corner of Ellsworth and College avenues, East End, Pittsburgh, Pa.

E. B. Kimball has been appointed receiver for the Carpenter Automobile Co., of Washington, D. C., which has filed a petition for voluntary dissolution.

Evan G. Evans has sold the Highland Garage, San Bernardino, Cal., to Hubert Waddington and M. C. York. The new owners took possession at once.

Ernest B. and Henry N. Yates, formerly of the Hancock Chemical Co., have taken over the business of C. B. Saxby, in Hancock, Mich. They will specialize in repair work.

Wasson & Lanigan is the style of a new concern which has established a garage at the corner of Chicago and Pekin streets, Lincoln, Ill. Buick cars will be handled.

The Niagara Sales Co. has been formed at Buffalo, N. Y., to deal in accessories, chief of which will be the Niagara engine

starter. Its salesrooms are at 704 Main street.

The Century Electric Car Co., of Detroit, has opened a branch in Chicago at 2023 Michigan avenue. It is the first of a chain of such stores which will be established.

Lee Odgers, proprietor and editor of the Davenport (Wash.) Tribune, has branched out and opened an automobile salesroom in that town. He will handle the Studebaker line.

Hoffman & Horan is the style of a new firm which has commenced business in Saskatoon, Sask., handling R. C. H. and Alpena cars. They are building a garage at 251 Third avenue, South.

A petition in voluntary bankruptcy has been filed against the Gainesville Auto Co., of Gainesville, Ga., by several of its largest creditors. No schedule of assets and liabilities has been filed so far.

Roy H. Whitman and Philip Kline have formed a partnership and are preparing to open a garage at 11 Cottage street, Gloversville, N. Y. They will handle the Warren-Detroit and Detroit cars.

Leland Mitchell and G. W. Edmonson have formed a partnership and opened a garage at 1886 Broadway, New York. Mitchell gained fame as a competitor in several of the Vanderbilt road races.

The Hart Motor Car Co., of Kansas City, Mo., has changed its name to Inter-State Motor Car Co. and opened new salesrooms at 1715 McGee street. As the name indicates, Inter-State cars will be handled.

M. D. Ovitt, of Pomona, Cal., has purchased the R. & C. Garage, at Tenth street and Second avenue, San Bernardino, Cal., from its owner, A. N. Monroe. He will continue it under the style the Tenth Street Garage.

The Armory at Kankakee, Ill., has been converted into a garage by Frank G. Babel, who has the Warren-Detroit agency for the locality. L. J. Myers, W. W. Cobb and C. H. Cobb are associated with him in the enterprise.

What is known as the P. N. Montague Garage has been opened at the corner of Main and Belew streets, Winston-Salem, N. C. The building is 110 x 180 feet and will house several well-known brands of popular-priced cars.

H. M. Paine, who has been sales manager for the Haynes Auto Co., 419 N. Euclid avenue, St. Louis, Mo., has taken over the business and will continue it under the style Paine Automobile Co. Haynes cars will remain his chief stock-in-trade.

The Stambaugh-Thompson Co., which operates a hardware and sporting goods store in Youngstown, Ohio, has added automobile accessories to its line, specializing in Diamond tires. Everything from a spark plug to motorcycles is handled.

The Empire Garage, which handled Empire and Stutz cars in Spokane, Wash., has relinquished its agencies and changed its name to Auto Commission Co. The company hereafter will deal in second-hand cars only, with E. A. Goldrick as manager.

Under the style of the Abbott Sales Agency a new company has "opened up" in Toledo, Ohio. L. E. Barger has been elected president of the concern, which will have the distribution of Abbott-Detroit cars in southeastern Michigan and northwestern Ohio.

Seabury Brothers and Carson Co., dealers in automobiles, farm implements and farm produce, have consolidated their respective businesses and are building a two-story warehouse 60 x 80 feet, in Logan, Ia. The consolidated concerns have a joint capital of \$60,000.

Carl J. Metzger and Roy Herrington, who for several years were connected with the Woods Motor Vehicle Co., in Chicago, have organized the Metzger-Herrington Co. and opened salesrooms at 2412 Michigan avenue, in that city. They will handle the Argo electric.

The Morris Motor Sales Co. is the style of a new company which will handle Chase trucks in the State of Indiana, with headquarters in Indianapolis. C. O. Morris, Donald Morris, Paul H. Krauss, Fred Krauss and Otto Krauss are the men who constitute the company.

The Oser-McFarland Auto Co., which recently took over the business of the Oser-Hunter Auto Co., is erecting a new building at the corner of Polk and McAllister streets, San Francisco, Cal., which will be ready for occupancy on July 1. It handles the Mitchell line.

The William J. Hawley Automobile Co. has been formed in Rochester, N. Y., and purchased the Seaman Garage on Phoenix street, where it will operate a general garage and renting service. Edson T. Case is president and William J. Hawley general manager of the new concern.

Manley, Loney & Co., who are the Saskatchewan agents for Ford, Reo and Russell cars, are building a two-story salesroom and garage, 54 x 125 feet, in Moose Jaw, Sask. The structure will be so built as to carry eight additional stories, if necessary, and it is claimed will be the finest garage in Western Canada.



Grand Rapids, Mich.—Grand Rapids Motor Truck Co., under Michigan laws, with \$600,000 capital.

Port Huron, Mich.—McDonough Motor Sales Co., under Michigan laws, with \$2,000 capital; to deal in motor cars.

Lawrence, Kan.—Durgin Auto Wheel Co., under Kansas laws, with \$10,000 capital; to manufacture automobile wheels.

Boston, Mass.—Laconia Car Co., under Massachusetts laws, with \$2,000,000 capital; to manufacture railroad cars and automobiles.

Indianapolis, Ind.—J. H. Kinney Co., under Indiana laws, with \$10,000 capital; to deal in automobiles. Corporators—J. H. Kinney, H. L. Dipple and G. E. Snyder.

Chicago, Ill.—Zilic Tire Co., under Illinois laws, with \$20,000 capital; to manufacture tires, etc. Corporators—Jesse O. Barker, F. W. Alexander, F. E. Alexander, Jr.

Tulsa, Okla.—Central Garage Co., under Oklahoma laws, with \$5,000 capital; to do a general garage business. Corporators—B. B. Calk, C. H. Tingley and C. F. Tingley.

Monticello, Ind.—Clifford Automobile Co., under Indiana laws, with \$15,000 capital; to deal in automobiles. Corporators—T. W. O'Connor, Michael Clifford and E. J. Sexton.

Chicago, Ill.—M. E. Dalton Co., under Illinois laws, with \$2,500 capital; to deal in automobiles and supplies. Corporators—M. C. Carlson, A. J. Moran and R. E. Cantwell.

Keokuk, Iowa—Water Power Garage Co., under Iowa laws; to operate an automobile garage and repair shop. Corporators—C. H. Dodge, W. J. Harter and W. D. McClellan.

Indianapolis, Ind.—Gilson Motor Starting Co., under Indiana laws, with \$5,000 capital; to manufacture engine starters. Corporators—R. K. Allison, Bert Gilson, R. B. Allison.

York, Pa.—York Taxicab Co., under Pennsylvania laws, with \$15,000 capital; to operate taxicabs. Corporators—John G. Mercur, Robert S. Frey, Louise W. Mercur and John W. Etter.

Monroe, N. Y.—Monroe Garage Co., under New York laws, with \$3,000 capital; to do a general garage business. Corporators—Wm. S. Jessup, Wm. F. Griffin and Harriet S. Jessup, all of Monroe.

Buffalo, N. Y.—Swiss Magneto Co., under New York laws, with \$250,000 capital; to manufacture magnetos. Corporators—Harry S. Martin, Dunkirk, N. Y.; A. A.

Meggett, Chicago, Ill.; Bradley H. Phillips, Buffalo.

Fishkill-on-Hudson, N. Y.—North Avenue Garage, under New York laws, with \$10,000 capital; to do a general garage business. Corporators—R. S. Tompkins, S. S. Mapes, R. S. Jones and others.

Yonkers, N. Y.—Riverdale Avenue Garage, Inc., under New York laws, with \$2,500 capital; to operate a garage. Corporators—Mary Rosenfelder, George Rosenfelder, Joseph Ennesser, all of Yonkers.

Watertown, Wis.—G. F. Hafemeister Motor Co., under Wisconsin laws, with \$10,000 capital; to deal in motor vehicles. Corporators—G. F. Hafemeister, R. F. Hafemeister, W. M. Wagemann.

Kansas City, Mo.—Ohio Motor Car Co. of Missouri, under Missouri laws, with \$15,000 capital; to deal in automobiles. Corporators—Arthur Leatherock, J. Frances Leatherock, Jasper E. Brady.

Chicago, Ill.—Englewood Auto Livery Co., under Illinois laws, with \$5,000 capital; to manufacture motor vehicles and accessories. Corporators—George E. Beale, James J. Ahearn, Ezra T. Fidler.

Dover, Del.—Storm Motor Car Co., under Delaware laws, with \$10,000 capital; to deal in automobiles. Corporators—Charles M. Storm, Washington, D. C.; W. I. N. Lofland, Dover; Jules P. Storm, New York.

Syracuse, N. Y.—W. D. Andrews Co., under New York laws, with \$50,000 capital; to deal in automobile supplies, etc. Corporators—Wm. D. Andrews, Roy Scroxton and Ross L. Andrews, all of Syracuse.

Willimantic, Conn.—Turnbull Auto Co., under Connecticut laws, with \$25,000 capital; to deal in automobiles. Corporators—David A. Turnbull, Frederick J. Wood, William M. Turnbull, Alice Turnbull, Elizabeth G. Wood.

Albany, N. Y.—Moyer Auto Sales Co., under New York laws, with \$5,000 capital; to deal in automobiles. Corporators—Stanton C. Shaver, Syracuse; William B. Phelps and W. R. Rose, both of 143 Central avenue, Albany.

New York, N. Y.—Terminal Auto Co., under New York laws, with \$10,000 capital; to deal in automobiles. Corporators—Gilbert N. Pearsall, 30 Church street; Selwyn J. Kidder, 1878 7th avenue; Frank R. Hilton, 14 East 127th street.

Brooklyn, N. Y.—Blue Taxi Co., under New York laws, with \$600 capital; to deal in automobiles. Corporators—Simon H. Miskind, 178 Hewes street; Herman M. Bamberger, 1055 Sterling place; Mitchell May, 347 East 26th street, New York.

St. Thomas, Ont.—Gaselectric Motors Ltd., under Canadian laws, with \$1,000,000 capital; to manufacture motor vehicles. Corporators—E. H. Thomas, B. F. Hon-singer, H. F. Slater, H. C. Thomas, C. M. Preston, F. McKitching, J. F. Roland.

Brooklyn, N. Y.—Fairchild Electric Vehicle Co., under New York laws, with \$50,000 capital; to deal in automobiles. Corporators—Frank K. Fairchild, 702 Fulton street; Marcus D. Fairchild, 158 Reid avenue; Arthur E. King, 255 New York avenue.

New York, N. Y.—Bryant Sales Co., under New York laws, with \$15,000 capital; to deal in automobiles and motorcycles. Corporators—William B. Haggerty, 25 West 42nd street; Brank B. Mansfield, 127 Duane street; Mary E. Wilson, 1547 Broadway.

New York, N. Y.—Empire Auto Top Co. of New York, under New York laws, with \$10,000 capital; to manufacture automobile tops, etc. Corporators—Bertram Garabrant, Bloomfield, N. J.; Mervyn Mackenzie and John J. Hayden, both of 258 Broadway.

Hempstead, N. Y.—Nassau Auto Co., under New York laws, with \$3,000 capital; to deal in automobiles. Corporators—Oscar L. Schweke, Jr., 72 Midwood street, Brooklyn; Phillip Schweke, 53 Midwood street; Edward F. Schweke, 274 East 23rd street, Brooklyn.

Providence, R. I.—General Motor Truck and Service Co., under Rhode Island laws, with \$10,000 capital; to do general automobile business. Corporators—Clarence G. Tompkins, Boston, Mass.; S. Wheelwright and Irving O. Hunt, of Providence, and Monroe D. Robinson, of New York City.

Brooklyn, N. Y.—Waverly Storage Co., under New York laws, with \$10,000 capital; to conduct an automobile trucking and storage business. Corporators—James F. McGuire, 106 West 30th street, New York; Katherine McCarthy, 102 West 29th street, New York; Abraham Sonnenstrahl, 139 Prospect Park West, Brooklyn.

Increases of Capital Stock.

New Haven, Conn.—White Motors Co., from \$5,000 to \$20,000.

Toledo, Ohio—Moore Motor Truck Co., from \$10,000 to \$200,000.

Changes of Corporate Names.

Anderson, Ind.—Mosher Automobile Co., to Anderson Automobile Co.

Des Moines, Iowa—Brown-Corley-Ellis Co., to Brown-Corley Motor Co.



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NEW YORK, MARCH 21, 1912.

REMOVAL NOTICE.

On and after Saturday next, 23d inst., the offices of the Motor World will be located at 1600 Broadway, corner of 48th street. The latch string will remain on the outside.

DASH LOCATIONS FOR GASOLENE TANKS.

With a footing already established in this country, as exemplified by one brand new car and another that is not so new, the dash-located gasoline tank which at present is engrossing the attention of foreign manufacturers by reason of its rapidly increasing popularity gives rise to another more or less knotty problem for designers to wrestle with. It was abroad that the construction really had its inception, following quite naturally in the wake of the skuttle dash, which apparently is one of the principal excuses for its being.

Of course, the location of the tank on the dash, or under a skuttle, has its advantages. But it also has its disadvantages, as has very nearly everything else, and it is for the car manufacturer to determine which is the weightier. There is one thing the system does, however, and it surely is an advantage. Without inconveniencing the occupants of the front seats by curtailing their leg room, it makes use of space which seldom is used for anything else and normally goes to waste.

Otherwise the advantages of the system may be enumerated on the fingers of one hand: (1) It permits a high tank with positive gravity feed; (2) it eliminates long pipes and with them much

of the danger of leaks and stoppages; (3) it eliminates the necessity for pressure feed; (4) assuming the tank must either be behind the rear axle or on the dash, the dash tank is better protected from accidental punctures; (5) it increases accessibility in general by permitting easy filling.

As against these advantages it might be pointed out that the gasoline is brought into closer proximity to the lamps and to the engine, which, however, need not cause apprehension as long as the gasoline remains in the tank. If the tank is punctured, however, the danger is greater than it would be if the tank were located under the seats or somewhere at the rear of the car. On the other hand, a leak in a dash tank might be more readily observable and save the motorist the inconvenience of a shortage of fuel at a critical moment. Furthermore, it must be apparent that in case of collision the dash tank is in a precarious position at least, though the same may be said of tanks located on the rear structures of a car. The risk of fire, due either to careless filling with the lamps lighted, or to a punctured tank, probably is the greatest disadvantage of the system; but the fact that so many foreign makers have adopted dash locations suggests that the risk does not cause them undue concern.

CONCERNING THE USE OF NICKEL TRIMMINGS.

With the waning popularity of polished brass as a material for automobile fittings and trimmings, which is plainly apparent, the use of nickel plating naturally has increased correspondingly, especially in cars of the higher grades. But while the nickel finish is a beautiful one it has the disadvantage that when used for parts subjected to constant handling it wears off.

This unavoidable condition suggests that it may not be unprofitable for motor car makers to turn their attention to the several composition metals that are used in many high grade motor boats for propellers, deck fittings and other hardware. Consisting largely of nickel, these metals have a fine silvery color which, of course, extends clear through; they possess great strength and can be worked into any desired forms—sheets, bars and so on; they do not corrode; are easily polished, and look well even after years of service. The cost probably would be somewhat higher than that of nickeled parts, but the difference in proportion to the cost of a high grade car would be negligible, and the low priced machines doubtless will stick to brass anyway.

WHY NOT SPRINGS FOR THE REAR SEATS?

While spring makers are concentrating their efforts in the endeavor to make springs of such size and shape as will carry the motor car body in the most luxurious way, and the makers of shock absorbers, auxiliary spring devices and similar appliances all are doing their share to eliminate vibration due to road roughness, it seems somewhat strange that practically nothing has been done in the way of applying a separate spring suspension system to the rear seats. The front seat is by far the most comfortable place in the car, and therefore it does not demand attention so urgently as the rear seats; and in any case, the steering wheel and control levers and pedals would offer obstacles to the introduction of springs under the front seat. But the rear seats might well be made the subject of experiments along such lines, and it is quite conceivable that the combination of pneumatic tires, body springs, shock absorbers and independent seat springs would result in a considerable augmentation of the comfort of the owner and his guests.

WIRE WHEEL FIGHT BEGINS ABROAD

Alleged "Master Patent" Bobs Up and Extensive Litigation in Prospect—Decision Rendered in Germany.

British courts soon will be asked to pass on the validity of what is claimed to be a master patent covering all forms of detachable wheels. Already the patent has been upheld in Germany, and an action for infringement sustained against Rudge-Whitworth, Ltd., through that company's German branch. Similar actions will be instituted, it is said, both in France and England, against another prominent manufacturer of detachable wire wheels, and the battle promises to be both lengthy and interesting.

Though the patent, No. 1,248, over which the squabble will take place was granted in 1906 to the New Arrol Johnston Co., Ltd., and J. S. Napier, the Patents Register indicates that it is owned jointly by Humber, Ltd., and J. S. Napier, an assignment having been recorded in 1908. As illustrated in the Official Patent Journal, the patent covers a detachable wheel consisting of fixed hub, which carries the brake drum and loose wheel, held in place by a number of bolts through the brake drum. Upon the removal of the holding bolts the wheel may be slipped off the fixed hub, the construction being substantially the same as is in use by a number of manufacturers. Subsequent to the original granting of the patent, the specifications have been amended in some respects, the present claims under which the legal battle will be fought being as follows:

"In combination with a live axle driving gear, the provision of driving wheel fittings constructed and adapted to be mounted directly upon the axle in combination with a road wheel which is adapted to be mounted upon the fittings, substantially as described, in such a manner that it may be readily dismounted without removing or disturbing the fittings, or their bearing adjustments, for the purpose of ensuring the ready interchangeability of each of the road wheels of a motor road vehicle, or their replacement by a duplicate road wheel."

Date of Washington Conference Changed.

More than 150 organizations having expressed their approval of the plan for the formation of a National Board of Trade, or National Chamber of Commerce, as proposed by President Taft, and 80 of them having appointed delegates, it has been found advisable to postpone the date of the meeting in Washington from April 15th to April 22d. Delegates are advised to make advance arrangements for hotel accommodations, as the Washington hotels usually are crowded during April. The

new Willard Hotel will be the headquarters of the conference, and the meetings will be held there. Secretary Nagel, of the Department of Commerce and Labor, who has the arrangements in hand, also recommends that all delegates who attend be fortified with suitable credentials signed by the president and secretary of their respective organizations.

Knight to Appeal from French Decision.

Because of a decision adverse to the Knight interests rendered by the French courts, the Daimler company, of England, has issued a warning that it "will give its support to any steps which are taken to uphold its rights against any person making or using sleeve valve engines which infringe the master patent of 1905, or the detailed patent of 1908." An appeal from the French decision, which was in favor of Rolland Pilain's single-sleeve engine, will be lodged, and the Daimler interests are fully convinced that it will be successful. The decision—which, in England, is considered extraordinary—declared the Knight engine invalid in France on the ground of its non-exploitation in that country, and also for lack of novelty, the court going so far as to uphold the Pilain patent and to award its makers damages to the amount of 60,000 francs.

Dealers Lose One Officer and Gain Two.

Because of the resignation of E. A. Young, of Bloomington, Ill., as secretary-treasurer, the directors of the so-called National Association of Automobile Dealers, which was organized by a number of Illinois retailers during the last Chicago show, have divided the two offices, and elected L. F. O'Donnell, of Jacksonville, Ill., secretary, and Julius Broehl, of Pana, Ill., treasurer. Although organized and incorporated under the laws of Illinois, the association hopes to interest the dealers of other parts of the country.

Dealers of Three Cities Get Together.

The dealers of Davenport, Ia., and Moline and Rock Island, have formed the Tri-City Auto Dealers' Association with the following officers: President, Gustave Burmeister; vice-president, H. H. Derrough; secretary and treasurer, W. L. Mason. The new organization will pilot the future Davenport automobile shows; former shows have been held under the auspices of the Davenport Automobile Club.

Three Damage Suits Aggregating \$125,000.

Three damage suits, aggregating \$125,000, have been filed against three automobile companies of Greater New York, in connection with accidents said to have been caused by the respective defendants. One of the complainants, Julius Weil, was hurt in an explosion which occurred in the garage of Bishop, McCormack & Bishop, of Brooklyn, and asks for \$50,000; Leah Cohen sues the Murray Hill Garage for the



March 25-30, Indianapolis, Ind.—Indianapolis Automobile Trade Association's first annual show in a tent auditorium covering University Park Square.

April 29-May 4, Burlington, Vt.—Burlington Merchants' Protective Association's annual show in State Armory.

May 4, Santa Monica, Cal.—Santa Monica road race.

May 14-17, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

May 30, Indianapolis, Ind.—Five hundred miles International Sweepstakes race on the speedway.

May 30, Salem, N. H.—Rockingham Park track races.

June 20, Chicago, Ill.—Chicago Motor Club's annual hall climbing contest on Algonquin Hill.

August 8-10, Galveston, Tex.—Galveston Auto Club's race meet on Galveston Beach.

death of her husband, who was run over by a car belonging to the defendant, and also asks \$50,000 damages; while Daisy I. Oehler wants the Thomas Motor Co., of New York, formerly the E. R. Thomas Motor Branch Co., to pay her \$25,000, for running one of its cars over her leg and breaking it. Thomas Mitchell, who was struck by an automobile belonging to the F. B. Stearns Co., of New York City, and who sued for \$10,000, compromised for \$600 before the suit came to trial.

Board of Trade Handbook Is Out.

Larger than ever before, as might be expected, and as handsome typographically as ever, the ninth annual edition of the "Handbook of Gasolene Automobiles" just has been issued by the Automobile Board of Trade. It is the usual well conceived compendium of the American products represented by the membership of that organization, and contains in its 200-odd pages illustrations, accompanied by concise specifications, of upward of 500 separate models of pleasure cars and commercial vehicles. Copies of the book may be had for the price of postage—10 cents—from the Board of Trade, at 7 West 42d street, New York City.

Chile Cuts Motor Car Duty 45 Per Cent.

According to a law which goes into effect tomorrow import duties on automobiles will be lowered from 60 per cent. to 15 per cent. by the Chilean government. This reduction has been decided upon despite the fact that duties on nearly all other manufactures have been raised.

PROTESTS AGAINST TIRE-DATING ACT

Tire Manufacturers Join in Opposition Bill in New York Legislature—Measure Gains Unexpected Headway.

Although it was believed that the bill requiring that all tires be branded with the date of their manufacture, which was introduced in the New York Legislature, would not gain headway, the fact that it passed the Assembly awakened the tire manufacturers to their danger, and as a result they have filed a joint protest against the enactment of the measure. Assemblyman Chandler and Senator Roosevelt fathered the bill and as they are not "strikers," the danger is acute. In part, the tire makers' protest says:

"This bill will create a situation for the dealers in tires in the State of New York under which it will be almost impossible for them to work. It will place tires in the class of perishable goods. Consumers will decline to accept tires unless dated a few days prior to time of purchase. It is physically impossible for manufacturers to supply the trade of this country under such conditions. Tires cannot be manufactured in sufficient volume to permit dealers to have fresh stock on hand at all times. Dealers could not afford to stock tires in the uncertainty that they would be sold speedily enough to still allow the dates to be sufficiently recent to warrant customer taking same.

"Manufacturers of cars could not be taken care of so that they could always ship cars to the garages for sale with fresh tires on. It would seriously handicap every dealer handling cars in the sale of cars. The purchaser would insist on old dated tires being taken off and recent dated tires placed thereon. The issue is more vital to the dealers' class of this country than to the manufacturers of tires. You would be left to work off your old stock as best you could.

"There is no public injustice righted by this bill, simply a destruction of necessary working conditions under which you must labor. All reputable manufacturers adjust with consumers without reference to the date of production. No public policy is therefore served, but a distinct injury to a large class of dealers engaged in the industry."

Those signing this statement are the following firms:

The Motz Tire and Rubber Co., Swinehart Tire and Rubber Co., Ajax-Grieb Rubber Co., Diamond Rubber Co., Empire Tire Co., Federal Rubber Mfg. Co., Firestone Tire and Rubber Co., Fisk Rubber Co., B. F. Goodrich Co., Goodyear Tire and Rubber Co., Kelly-Springfield Tire Co., Lee Tire and Rubber Co., Michelin Tire Co., Pennsylvania Rubber Co., Republic Tire Co.,

Seamless Rubber Co., Stein Double Cushion Tire Co., and United States Tire Co.

Where the Best Roads Are Located.

New York, according to the reports of the Director of the Office of Public Roads, is the only State in the Union which, in the five-year period between 1904 and 1909, has shown a substantial gain in mileage of improved roads. The report, which just has been made public and which is drawn from the census statistics, reveals that whereas there were only 5,876 miles of improved roads in New York State in 1904, the total had jumped to 12,787 miles in 1909. Of the eight States which are listed as having the greatest number of miles of improved roads, Indiana leads, their standing being as follows:

	—Mileage Improved—	
	1904.	1909.
Indiana	23,877	24,955
Ohio	23,460	24,106
New York	5,876	12,787
Wisconsin	10,633	10,167
Kentucky	9,486	10,144
Illinois	7,924	8,914
California	8,803	8,857
Massachusetts	7,843	8,463

Where a decrease is shown it is due to reclassification of roads.

The gain in New York, according to the director, is due largely to the fact that the State has bonded itself for \$50,000,000, and that \$5,000,000 a year or more is being expended by the State, in addition to a considerable sum by the separate counties, in building roads. At the present time New York is leading all the States in the amount of actual progress made, and if the present pace is maintained it is not unlikely that the figures representing the number of miles of improved highways in Indiana and Ohio shortly will be exceeded by New York.

Warren's Non-Stop Record, 12,405 Miles.

Having rolled up a grand total of some 17,000-odd miles in the first officially sanctioned and observed non-stop pleasure car test, the motor of the Fisk-tired Warren "30" car, which, as was told last week in the Motor World, was started in San Francisco on January 20th, finally was stopped in that city on the afternoon of the 9th inst., with a hall-marked record to its credit that will take a lot of beating. For a long time after the test was started the motor ran without a hitch, but when a little over 5,000 miles had been covered a clogged gasoline line necessitated a stop which exceeded the 60-second limit. Immediately afterward, however, the motor was started again, and before it finally was stopped an additional 12,405 miles was covered, the car being piloted over the roads of San Francisco and environs under the auspices of the Matheson Sales Co., the Warren agent in that city. Inasmuch as the American Automobile Association never before had officially sanctioned a non-stop pleasure test, and as official observers were present at all times, the acceptance of the record is practically assured.

THREE NEW ONES AT DENVER'S SHOW

Two of Them Are Trucks—Electric Cars Appear in Strong Force—Show Unmarred by Postponement.

Postponement in no way blighted the eleventh annual automobile show which held full sway in the Denver (Col.) Auditorium for five days, ending the 16th inst. The local trade co-operated with the show management with the result that 48 different makes of motor vehicles—three of them new on the 1912 show circuit—were staged by 30 dealers, while accessory row, which was housed in the basement, was well filled with the wares of 20 exhibitors. Of the newcomers, the Fritchle electric is a local product, and was shown with both pleasure and commercial bodies by the Fritchle Automobile and Battery Co.; the other two newcomers, both trucks, are the Wichita Falls and the Weeber. Of the total number of machines on the floor, fully two-fifths were electrics, which serves as an indication of the popularity of that type of vehicle in Denver. Decorations were ample and eye-pleasing, although more or less conventional. Yards and yards of bunting covered the bare spots on the walls and the ceiling girders, and many incandescents supplied the illumination.

The complete list of all vehicle exhibitors is as follows: W. W. Barnett, Alco and Stoddard-Dayton and Alco truck; Fernand Automobile Co., Maxwell and Columbia; Charles Bilz, Franklin and Chase truck; Felker Auto Co., Bergdoll, Stevens-Duryea and Waverley electric, pleasure and commercial; Alkire Motor Car Co., Thomas and Midland; Cole Motor Car Co., Cole; Maxwell-Chamberlain Motor Car Co., Peerless and Haynes; R-C-H Corporation, R-C-H and Hupp-Yeats electric; Mathewson Automobile Co., Reo, Locomobile, Premier and Oakland, and Ohio and Standard electrics; Overland Auto Co., Overland, Winton and Baker electrics; Kissel Kar Co., Kissell; Fritchle Automobile and Battery Co., Fritchle electric, pleasure and commercial; E. R. Cumbe, Rambler; Thomas Botterill, Pierce-Arrow, Hudson and Columbus electrics; McDuffee Motor Co., Chalmers and Stearns; Havens Motor Car Co., Dorris; Western Motor Car Co., Abbott-Detroit; Colburn Auto Co., National and Rauch & Lang electrics; Carstarphen Electric Co., Flanders electric; Ford Motor Co., Ford; Stanley Motor Carriage Co., Stanley steamer and Stanley truck; A. T. Wilson Auto Co., Mitchell; J. I. Case Co., Case; Krebs-Gottschall Motor Car Co., Lozier and Detroit electric; Metzger Motor Car Co., Everitt; Velie Motor Vehicle Co., Velie; Elmore Auto Co., Elmore; George E. Hannan, Jackson; Wichita Motor Sales Co., Wichita Falls truck; Weeber Car and Mfg. Co., Weeber truck.

Motorcycles were shown by: Hendee Mfg. Co., Indian; Mead Autocycle Co., Autocycle, New Era Motorcycle Co., New Era.

Accessories were shown by: Capitol Hill Garage, W. E. Dinneen, Continental Oil Co., Wyoming Asbestos Co., McDuffee Motor Co., Kimball Tire Casing Co., Brackett Welding Co., Regent Rubber Co., Carstarphen Electric Co., Better-Than-Air Tire Filler Co., Fireman's Fund Insurance Co., Fry & McGill Motor Supply Co., Boss Rubber Co., Denver Auto Goods Co., Great Western Oil Co., A B C Anti-Puncture Co., Transcontinental Chemical Co., Colorado Tire Co., Manley S. Wrenn, Western Supplies Co., O-Tak-A Tire Remover Co., Brooke Patent Airless Tire Co.

Vanderbilt Race Spectator Gets Verdict.

An echo of the last Vanderbilt race held on Long Island was heard in the Queens County (N. Y.) Supreme Court on Monday last, 18th inst., when a jury awarded Thomas Muller \$22,500 damages for injuries received during the running of that classic race in the fall of 1910. The defendant, the Pope-Hartford Automobile Co., made a motion to have the verdict set aside, but Justice Maddox refused to grant it.

According to the complaint, Muller was standing on the embankment near the Westbury turn when, it is alleged, the Pope Hartford racing car driven by Jack Fleming ran up on the embankment in order to avoid collision with a car which had become stalled near the turn, and crushed both of Muller's legs. The attorneys for the defense claimed that at the time of the accident the Pope-Hartford car was on another part of the track, and that there was considerable confusion at the time of the accident, cars following each other in rapid succession, but the jury evidently was impressed by Muller's story and awarded him the verdict.

The judgment is directly opposed to the decision of the Appellate Division of the New York Supreme Court, which not long ago held that a visitor to a road race cannot collect damages for injuries received if it be proven that he went to the place of accident with the idea of witnessing the race. An appeal probably will be filed by the defendant company.

Another Towing Test of an Inner Tube.

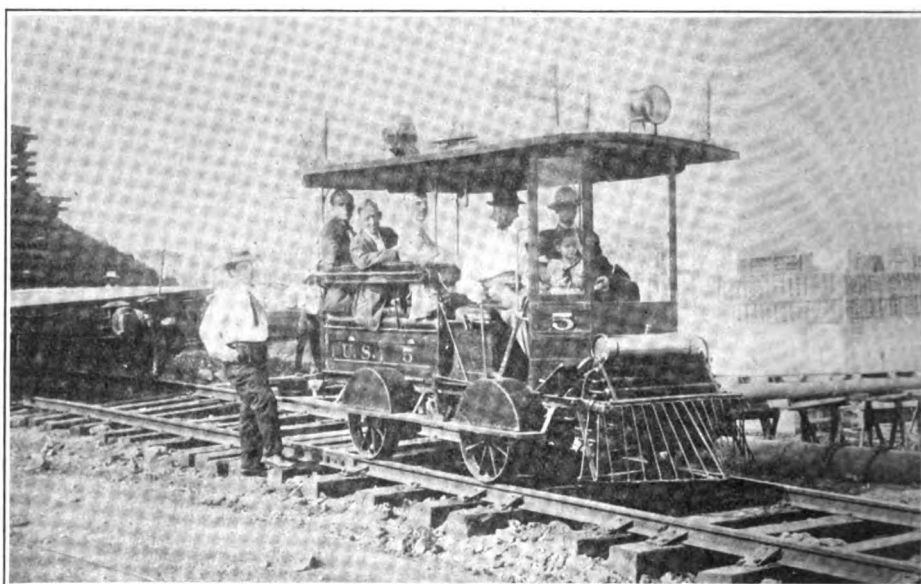
Spectacular performances very often are nothing more than spectacular: in other words, they are of no real use except in an advertising way. Sometimes, however, a really useful purpose is served and more or less valuable information is gained from feats that usually are classed as mere "stunts." A case in point is the test recently made of a Fisk pure gum inner tube, which was used as a tow rope for hauling a 3,000-pound automobile through the streets of Redlands, Cal., by William Thornquest, of the Redlands Vulcanizing

Works, which has the local agency for Fisk tires. A length of rope was attached to the rear axle of the towing car and another length to the front axle of the towed machine, the tube being used as a connecting link between the ropes—an improvement on a similar stunt performed in another part of the country a few weeks ago. At the end of the test the tube was reported to be uninjured, though when starting the machines the rubber would stretch some 10 feet, contracting somewhat after the first pull was over.

Inspection Car in Use in Panama.

Down on the narrow neck of land which forms the visible connecting link between North America and South America, the roads, such as they are, scarcely are worthy

For some years the contract for carrying of mail between the main office and the branches had been held by one H. E. Lapp, but last week the drivers employed by Lapp went on strike and in consequence the Rochester mail service was crippled. The difficulty immediately was reported to Washington and a representative from the Postmaster-General's office went post haste to the trouble zone. Finding a peaceable settlement of the strike out of the question, as Lapp was unable to pay overdue wages, the post office inspector canceled the contract and hired five motor trucks to do the work temporarily, or until a new contract can be let. The new contract probably will be made with an automobile company, as the money consideration (\$7,500 per year) is not considered



GOVERNMENT MOTOR INSPECTION CAR IN PANAMA CANAL SERVICE

the name. Along the right of way of the Panama Canal, which eventually will sever the two continents, but in doing so will bind them closer together, there are no roads at all that are suitable for automobile travel and Uncle Sam's engineers must needs rely on the railroad for transportation. But as locomotives and cars are not always immediately available for conveying engineers and others on inspection tours, there recently has been placed in the Government service the gasoline propelled inspection rail car which is shown by the accompanying picture. The capacity of the car is six or eight passengers, in addition to the "engineer"—or the chauffeur, whichever he may be—and fair speed is made over the rails. In addition to the "cow-catcher," the equipment includes a compressed gas whistle and a big gong, both of which are carried on the roof.

Why Rochester Got Motor Mail Service.

Due to an unusual combination of circumstances the city of Rochester, N. Y., quite suddenly and unexpectedly was provided with a motor mail delivery system.

sufficient to be profitable for nine horse-drawn wagons with drivers—which were the terms of Lapp's contract.

Where Swiss Tourists Pay No Duty.

Tourists visiting Switzerland this summer, when coming from the direction of France, will not be called upon to submit to customs regulations or examinations, provided they do not go further than the Canton of Savoy, of which the city of Geneva is the natural, if not the political, center. As the majority of tourists visit Chamonix, Mont Blanc and other points in the Savoy Alps by entering from France via Geneva, this new order of the Swiss government amounts to the establishment of a so-called "free zone" on the frontier between France and Switzerland.

Flame That Betokens Leakage of Gas.

If all is well with the gas piping, the flame of an acetylene burner will at first be blue, but will very quickly turn to bright white. If the burner lights with a flame of yellowish tinge it is very probable that there is a leak in the connections,

INCORPORATING THE FAN IN THE FLYWHEEL

Practice That Has Found a Number of Recent Followers and the Varying Methods Which They Bring to Bear—Systems in Which Separate Fan and Flywheel Fan Both Are Employed—Pros and Cons of the Two Types of Fan.

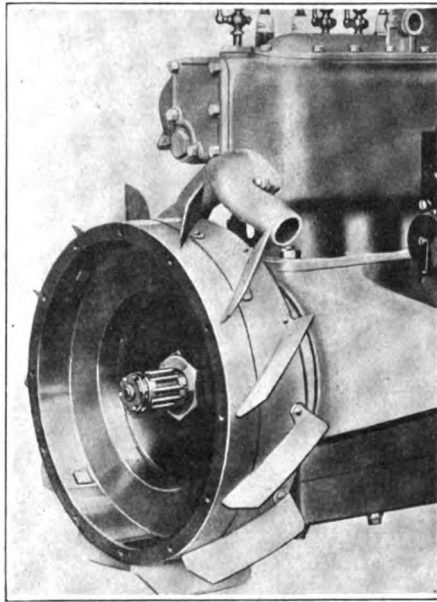
"I read an ad. the other day," remarked an independent engineer with a penchant for constructive criticism, "and the particular peg on which the manufacturer of the device—an engine starter—chose to hang his argument was: 'There is no part of it moving which will require lubrication when the engine is running.' It appears to me that there is a sermon in that little phrase that it would do every manufacturer good to digest. Assuming that lubrication implies attention, even if it is only occasional, it is evident that there still remain a great many parts of an automobile which might be considerably simplified, despite the apparent progress which marks the automobile industry as one of the most progressive in the world.

"Take the fan for instance," he continued; "there is the evident possibility of incorporating the fan in the flywheel, a practice which not a few manufacturers already have adopted. Though statistics tend to prove that the practice is not as general as it was, say, a couple of years ago, which probably is due to the high state of perfection to which the manufacture of fans has been brought, it is significant that a manufacturer who is considered to be among the best there are abroad, and who in comparatively recent times has undertaken the production of his cars in America, seldom uses separate fans; his latest product, which reflects the top notch of engineering practice, is without a separate fan. And there are other products, equally as late, that have their fans formed of the spokes of their flywheels. In that way a whole raft of separate parts are eliminated and production costs are lowered, though not in direct ratio, because of the added cost of casting a fan blade flywheel. The actual cost is lowered, however, and I should think the practice would be more in vogue than it is."

While the argument is right in the main, and it would appear that there is no real reason for a separate fan, such is not the case. Under certain conditions there is necessity for a fan, but, on the other hand, it should not be forgotten that in eliminating the fan by incorporating it with the flywheel considerable rearrangement of other parts also is necessary. For instance, it is necessary that the hood be tight in order to ensure a draft through the radiator, and it is further necessary that the pan be tight and that the flywheel be enclosed as tightly as possible around its periphery, in order that the action of the

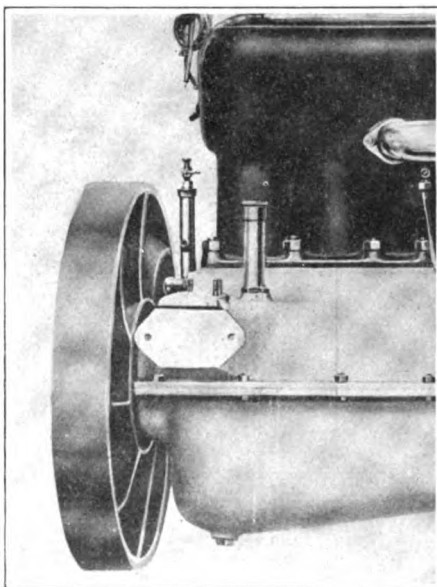
fan blades shall have the desired effect in producing a partial vacuum under the hood.

As has been previously mentioned, the



LIPPARD-STEWART PERIPHERAL BLADES

better construction of fans at the hands of specialists, and their materially increased efficiency, is responsible in no small meas-



FIAT FAN FLYWHEEL

ure for their present extended use, as against a few years ago. Today fans are silent, are practically trouble-proof, re-

quire only a part of the power to operate that they did a short time ago, and require attention only at long intervals. Loose or broken belts, of course, are a possibility, though the possibility has been largely reduced through the increasing use of V-belts, and it is in the respect that the flywheel fan obviates such troubles entirely that it scores.

Despite the arguments which may be advanced for the flywheel fan, however, that the separate fan behind the radiator never will entirely disappear must be apparent if for no other reason than the cone clutch now is as much in favor as it ever was, and is not likely to share any appreciable diminution of favor in the immediate future. In the meantime the separate fan continues to flourish, and is likely to flourish for some time to come.

With the average four-cylinder engine of, say, 40 horse-power, the diameter of the flywheel will be about 20 inches, varying slightly according to the individual ideas of the designer. If a cone clutch which will just carry the load is used, slippage is likely to occur at critical moments. Hence it is the practice to allow as great a factor of safety as is possible, which means that, as a general rule, the engaging surface of the clutch is made as large as possible. In other words, the greatest diameter of the male clutch member is approximately the same as the diameter of the flywheel, the face being as wide as is possible, while permitting a high factor of safety in the flywheel itself.

Such is the general practice; but where it is desired to incorporate the fan in the flywheel by making the flywheel spokes into fan blades, obviously, it becomes necessary to reduce the diameter of the clutch. The exact diameter which must be used will vary, of course, according to the clutch spring pressure, though it is doubtful if the greatest diameter of the clutch can be made less than 10 inches. Even at 10 inches, the spring pressure is likely to be excessive, and, barring the undesirable end thrust placed on the crank shaft, there is likelihood that at peak loads slippage will occur.

Assuming that a cone clutch 10 inches in diameter can be made to carry the load without slippage, however, and allowing one inch for the rim of the flywheel, there remains only four inches which may be utilized for fan purposes. There is the alternative, of course, of forming the clutch hollow, so to speak, so that the draft in-

duced by the spoke blades will blow through it, but there are difficulties of construction which militate against this method of construction. It is so much simpler to cast the male member solid, of aluminum, or, rather, cup-shaped, or to use a pressed steel member of the same shape and thereby gain strength, that few manufacturers care to go to the expense of more complicated construction which scarcely warrants the outlay.

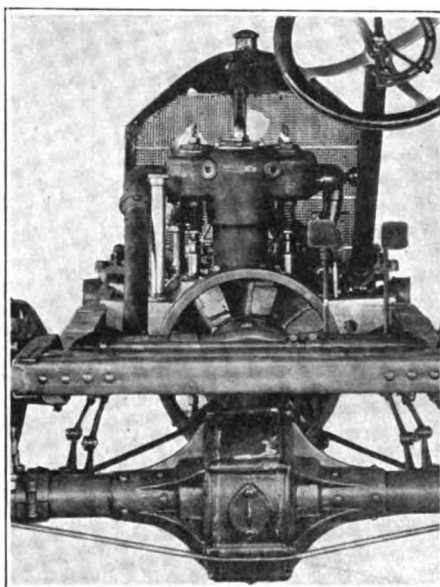
There is another alternative, in which the cone clutch may be made the full size of the flywheel, which also may be orthodox in construction, either having spokes or a solid section in place of spokes, the latter being the general practice, and with fan blades fastened to the periphery, after the manner used in Lippard-Stewart commercial vehicles and in other cars; the method of construction is shown in the accompanying illustration. The illustration itself is self-explanatory, the fan blades being merely riveted in place on the rim of the flywheel. They are of such shape that they act like an exhaust fan. As the air is exhausted from the space below the engine hood, fresh, cool air rushes in through the radiator.

As has been previously stated, all such systems in which a fan flywheel serves the purpose of an exhaust fan necessitate that there be only one entrance for the cool air and that must be through the radiator. The mere making of the hood and underpan as airtight as is necessary is not in itself an insurmountable difficulty and, far from being objectionable, really is desirable for the amount of foreign substance which can find its way in and be distributed over the engine and accessories is lessened. Incidentally, the deleterious results of a generous sprinkling of water over the engine, due to the carelessness of the person to whom is entrusted the washing of the vehicle are obviated.

It is to those cars which are equipped with multiple disk clutches, however, that the fan flywheel is most readily applicable; for, as a rule, the multiple disk clutch housing is very much smaller than the cone clutch and there is ample room for making the spokes of the flywheel into fan blades which shall be entirely efficient in maintaining the cooling water at the proper temperature. Quite a number of manufacturers now rely on fan flywheels to the exclusion of separate fans, with their numerous other parts—such as pulleys, bearings, brackets, methods of belt adjustment and belts—and reported cases of chronic overheating are remarkably scarce.

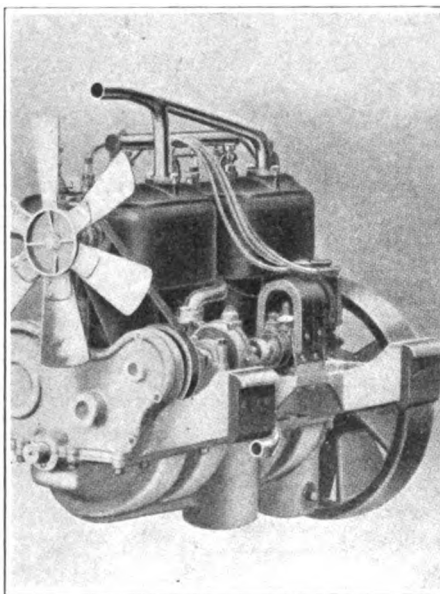
In the latest production of the Fiat works in Turin, Italy, and Poughkeepsie, N. Y., a six-cylinder car which exemplifies the most up-to-date engineering practice, the separate fan is conspicuous by its absence. Instead, the spokes of the flywheel are cast in the form of fan blades. As an indication of the faith of the company in the method of construction and as proof of

the efficacy of the fan flywheel to cool even the largest motor under the most adverse conditions, the tremendous Fiat with which Bruce-Brown won the Grand Prize race at Savannah last fall employed no fan other than that formed of the spokes in its flywheel.



STUTZ FLYWHEEL AND FAN

Despite the fact that there are plenty of evidences that a fan flywheel can be made so efficient as to make unnecessary the separate fan, some manufacturers prefer to use both, though it is explained that either



PALMER-SINGER COMBINATION

alone is sufficient to prevent the motor from overheating. Therefore, if for any reason the separate fan should be put out of commission, the car might still be driven, sufficient draft being created by the fan flywheel to prevent the motor from overheating to the danger point, at least. The Stutz is one of the cars in which both

are employed, the arrangement being shown in the accompanying illustration. The pan has been removed the better to show the shape of the flywheel blades. One blade of the fan is visible in front of the engine. In the larger Palmer & Singer motors, also, both separate fan and fan flywheel are used, the shape of the flywheel blades, as may be seen in the picture, being slightly different from that used on the Stutz cars, and quite different from that used in Fiat productions.

Though there is no reason to expect that the separate fan will be entirely eliminated from all cars, for the reasons that have been pointed out, it is reasonable to expect that the fan flywheel ultimately will occupy a more conspicuous niche than it does at present.

Clogged Mufflers That Cause Power Loss.

Whether the use of a cut-out is made illegal or not, it is well occasionally to examine mufflers for accumulations of soot which clog the passages and cause back-pressure and loss of power. It is true that the newer types of mufflers such as are fitted to modern cars do not offend in this respect to the extent that older models, which really made necessary a cut-out in the first place, do, though there still are some that are far from perfect. Those in which the baffle plates are drilled with a number of tiny holes are the worst offenders, and where it is not possible to remove the muffler bodily and take it apart, light blows with a small hammer while the engine is running with the throttle about half open will serve to dislodge the greater part of the accumulation. It should be remembered that when any of the various carbon removers on the market are used to remove deposits from cylinders, the accumulation is blown into the muffler, where it is exceedingly prone to remain by reason of its sticky nature. It is a wise plan, therefore, to remove the muffler, if possible, before the carbon purging process is started, or at least to open the cut-out, if one is provided, after blocking the entrance to the muffler with a piece of wood or other material.

Tell-Tale for Electric Tail Lights.

While the extinguishment of a tail light when oil is used as a fuel is more or less excusable, since no simple device has been provided to warn the driver that the light has "gone out," with the electric lighting system this is not the case. For it is possible to easily arrange an effective "tell-tale" by connecting the tail light in series with the speedometer light, or, if provision for a speedometer light is not made, with one of the side lights. Naturally the bulbs will have to be changed to bulbs of the same candlepower which will burn on half the voltage. When connected in this way, when one of the lamps goes out the other also is extinguished and the driver immediately is apprised.

DETROIT'S NEWEST ELECTRIC TRUCK

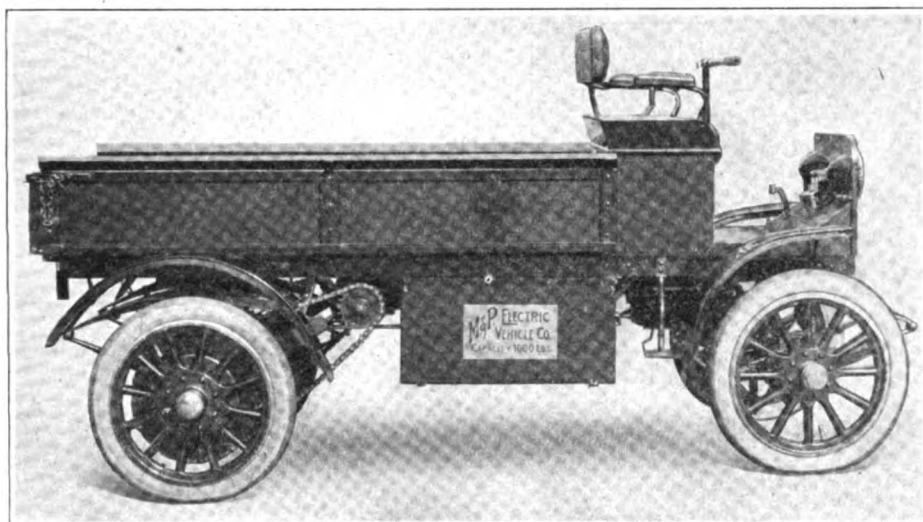
Of Attractive Design, it Shows Influences of the Gasolene Vehicle—Features That Serve to Distinguish It.

While it is by no means likely that electric motor vehicles, as a class, ever will relinquish the distinctive outward characteristics that stamp them unmistakably, many of the mechanical details show a constantly increasing resemblance to similar parts of gasolene cars. There is a strong tendency on the part of manufacturers of electrics to adopt certain types of power transmission mechanism, for in-

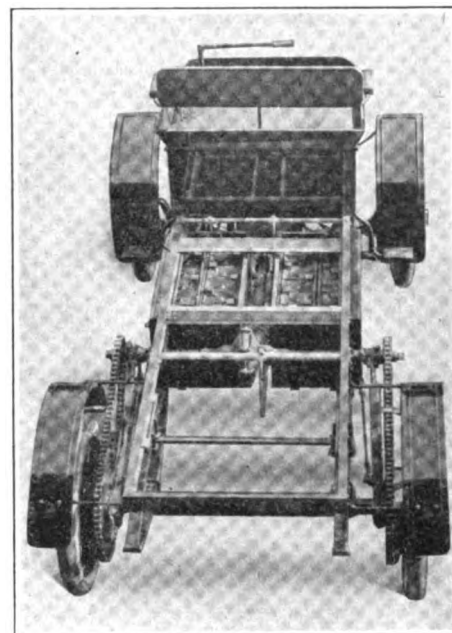
each side of the car, with a space left between them for the propeller shaft. The boxes are so placed that the mud-guards and other parts of the car do not interfere in any way when it is necessary to obtain access to the cells, and when the body is in place the weight is advantageously distributed, there being sufficient weight on the rear wheels for traction, even when the car is not loaded, but not more than ordinarily is necessary.

According to the manufacturer, the greatest pains have been taken to make every part of the chassis accessible, this being the reason for adopting the design used. Still another advantage is that all the wiring is very short. The front ends of the battery boxes, from which the bat-

ball bearings. Wood artillery wheels, built according to the S. A. E. standard, are fitted with pneumatic tires if so desired, on special order, though 2½-inch solid tires constitute standard equipment. Wheels are 32 inches in diameter, front and rear. Standard practice is followed in fitting the car with two sets of brakes, a 10-inch expanding band brake on the countershaft and a pair of similarly designed brakes, 14 inches in diameter, on the rear wheels. Pedals are employed in the operation of both sets of brakes. The motor, which is a Westinghouse machine, is suspended



SIDE VIEW OF M & P ELECTRIC DELIVERY WAGON



M & P ELECTRIC CHASSIS

stance, that have proved their worth in gasolene machines, and results would seem to justify this course. A vehicle that illustrates this point is the M. & P. electric commercial vehicle, which, though in process of development for some time, has but recently been placed on the market by its maker, the M. & P. Electric Vehicle Co., of Franklin and Dubois streets, Detroit, Mich.

The accompanying illustrations show clearly the arrangement of the motor, the transmission system and the divided battery. Placed well farward, the motor drives through a propeller shaft to a countershaft through the usual bevel gears enclosed in a housing which also contains the differential; side chains to the rear wheel sprockets constitute the final drive. Stout radius rods relieve the rear springs, which are full elliptics, of all driving stresses and at the same time leave them free to perform the work for which they are designed—the absorption of shocks and vibration.

In order to permit the use of a propeller shaft, which is a necessary accompaniment, in this design, of the forward motor position, the battery is divided into two sections of 20 cells each, each section being enclosed in its own box and hung one on

tery leads are carried out, are close to the motor, and the motor is almost directly under the controller, which is located under the driver's seat. This matter of short wiring is an advantage no matter from what point of view it is considered. There is little wire used and little work required to string it; every foot of wire eliminated reduces the possibility of short-circuits and grounds, as well as the possibility of mechanical injury to the insulation; and the resistance to the flow of current is cut down to the lowest point—though even with long wiring this is not really a serious matter if wire of adequate cross-section is used. In case of trouble in the electrical department the fact that all the parts involved are close together saves no little time in the location of the fault. The motor is readily accessible through the floorboards and the controller is reached through the front-boards of the seat.

The main frame of the chassis is made up of three-inch channel steel with ends and cross pieces of the same stock, hot-riveted in place. Both axles are of Weston-Mott manufacture, the front axle being of I-beam cross section and the rear axle of rectangular forged steel. The countershaft is of the same make, and all bearings are

from the frame by specially designed brackets, and can be removed when three bolts are withdrawn. The controller also is a Westinghouse product and is of the constant torque type.

An interesting constructional detail that does not appear on casual inspection is the connection between the rear springs and the frame. The usual form of fixed attachment is not employed; instead, the top spring center is arranged to slide in a seating attached to the under side of the frame, so that the thrust of the radius rods caused by the movement of the springs imposes no abnormal stresses on the leaves, the springs merely sliding back and forth without strain.

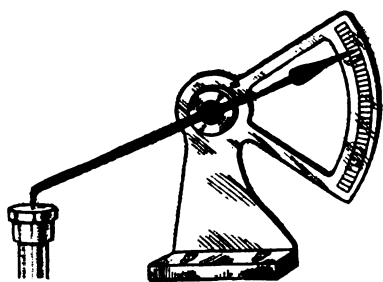
While the stock equipment of the M. & P. truck, which is designed for 1,000 pound loads, includes a steering wheel 15 inches in diameter, the tiller type will be fitted at the option of the purchaser. The steering mechanism consists of a worm and sector. The wheelbase of the car is 100 inches and the tread 56 inches.

The M. & P. Electric Vehicle Co. is a \$50,000 company, of which Charles L. Pepper is president and general manager; M. C. Merriman, treasurer and sales manager, and Burton Grandy, secretary.

Ingenious Means for Adjusting Valve Lifts.

Sweetness of action, obtainable only through the agency of uniformly forceful explosions in every cylinder of an engine, is that which every motorist desires above all else, provided his motor will run at all, and there are many things which make for jerky running with its attendant discomfort and deleterious effect on the remainder of the machinery. Improper ignition—spark plug gaps of different sizes, or wiring that permits some of the "juice" to escape—are two most prolific sources of such troubles, though they cannot always be so traced. Valves which do not open all the exact same amount quite as often may be the cause, and it was to remedy a discrepancy of this kind that an ingenious chauffeur devised the indicator which is shown herewith.

That there undoubtedly is a necessity for a device of the kind in a well-equipped shop is indicated by the fact that out of ten modern cars nine of them will have adjustable valve tappets, and unless the intake valves in particular open just the same

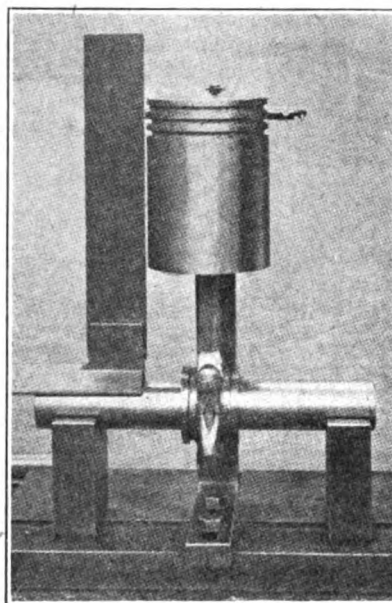


amount, to allow each cylinder the same volume of charge, uneven running of the motor will result. Of course, it is possible to line all the valve tappets up with a straight-edge, and providing the valve stems are the same length the valves then will open the same amount. But this can only be done by removing the tappets, and even where this can be accomplished easily, there remains the possibility that when replaced some slight inequality of the cams or the bearings may make such methods practically useless. With a device of the kind illustrated, however, the tappets may be adjusted while they are in place and their exact height determined to a nicety. "The base and angle piece of the tool," says the inventor, "can be made of sheet metal, or any suitable odd pieces of metal that may be lying about the shop. The indicator finger was at one time the hand of a clock and the spring was extracted from the interior of an old watch. I drilled a hole into the stock to take the spring barrel, which I then soldered in position. The finger was fastened tightly to the spindle and a pin was screwed in the face of the stock to act as a stop for the finger. When two holes had been made in the base the tool was complete. The finger is so firmly held by the spring barrel that a fixed definite resister is obtained. By transferring the device to other tappets, cams, etc., com-

parisons and adjustments can be made easily and accurately."

Useful Jig for Truing Pistons.

Though it is to full automatic machinery and devices which insure absolute accuracy of parts that the automobile industry owes its growth in a greater measure than generally is supposed, it is seldom that the man in the street has opportunity of understanding the innermost secrets which make possible the production of vast numbers of machines which vary not a whit from each other in their appearance or their mechanical perfection. For which reason the device which is illustrated herewith and which is in use in the works of the Austin Motor Co., of England, is of interest,

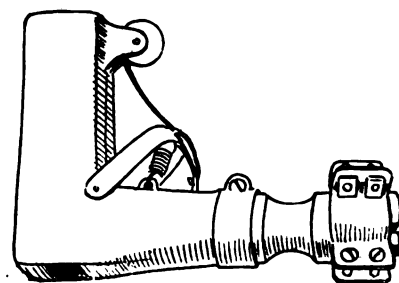


though the ingenuity of the device alone is sufficient to arrest attention. It is a jig which is used to determine that pistons are "square" with the crankshaft.

Elaborating on the old method of placing a steel set square on the crankshaft and in this way determining whether or not the piston is properly lined up after connecting rods big end bearings or wrist pins have been re-bushed, the inventor has provided a jig which permits quick determination of errors if they exist and which may be used on any one of several different sized pistons with equal facility. The jig consists of a mandrel or test bar, known to be accurate, which rests on two V blocks firmly mounted on a solid metal base. In order to test a piston after the bearings have undergone treatment, the big end bearing is slipped on the mandrel and is supported by a bar at the rear which keeps it upright. A set square having a V base then is placed on the mandrel and shifted up to the piston. Inaccuracies are made plain by placing a sheet of white paper behind both the piston and the square, which makes it easy to see any space left between square and piston.

Exhaust Whistle That is "Mellow."

Of the making of horns and whistles for motor cars, like the making of books, there is no end. Every little while a new variety crops up, and the famous fifty-seven varieties long ago became far more numerous. One of the more recent devices is the National whistle, shown in the accompanying illustration, which is of the much favored type in which the exhaust gas from the motor is employed as the sound-producing agent. It is made by the National Signal Co., of 123 Kosciusko street, Brooklyn, N. Y., and comprises a hollow L-shaped aluminum casting attached to the discharge end of the muffler by means of couplings which are furnished to fit all sizes of pipe without the use of reducers. The coupling is at the end of one of the arms, while the other arm, which has its end closed, stands in a vertical position. At the bottom, under the vertical arm, is a rectangular opening, and within the whistle is a swinging valve pivoted at the inside corner of the "L" and actuated by a lever to which is attached a cable, as the illustration shows.



tion shows. Normally the valve is held so that it is diagonally across the lower end of the hollow upright column, above the bottom opening and in line with the lever, as it is shown in the illustration. This gives a free passage for the exhaust. When it is desired to sound the whistle the cord is pulled, when the valve swings until it almost closes the horizontal arm just above the edge of the opening nearest to the muffler connection. A narrow slit is left under the lower edge of the valve, and the gas, in a thin, wide current, impinges on the opposite edge of the opening, setting up vibrations in the column of air above it and thus producing the sound, which is described as being loud enough to be heard above traffic noises, and at the same time not at all disagreeable—in fact, "mellow and pleasing," to quote the makers.

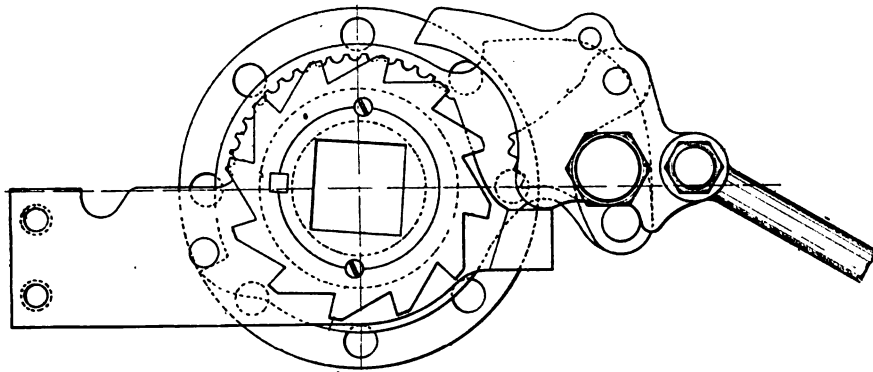
When to Turn Off the Warm Water.

There are those who maintain that all carbureters which are water-jacketed should be provided with a cock so that the warm water can be turned off. The time to turn off the water is on ascending a very long or very steep grade, when the cooling water is liable to be so hot as to cause the formation of too much gasoline vapor, with the effect that little or no liquid fuel is fed through the jet. Irregular running is the result.

DOES NOT DEPEND ON DEAD CENTERS

How Simplex Engine Starter Overcomes That Difficulty—Ingenious Ratchet That Accomplishes Purpose.

While most motor starters depend for their operation upon the stopping of the motor off the dead center, the device that has been brought out by the Simplex Mfg. Co., of Anderson, Ind., is designed to do its work whether the motor stops on the dead center or not. The Simplex starter, incidentally, is launched under decidedly favorable auspices, for the company is headed by W. R. Poland, formerly general manager of the Remy Electric Co., whose high opinion of the merits of the new device led him to relinquish his office with the Remy company to take the presidency of the Simplex concern.



MECHANISM OF THE SIMPLEX STARTER IN DETAIL.

The principle of the starter is that of priming the cylinders of the motor with gasoline vapor and then rotating the crankshaft until the charges are fired by the regular ignition apparatus and the motor takes up its regular cycle of operation. The advantages claimed are that the motor already is in operation when the first charge is exploded, and that consequently there is no danger of straining or breaking the crankshaft, as there might be in starting the motor from a state of rest by means of an exploded charge, and that no special tanks are required, the priming being taken from the pipe leading from the regular fuel tank.

The apparatus used consists of a starting ratchet, shown in the illustration, which is mounted on the crankshaft at the front of the motor or else on the shaft between the clutch and the gear box, a pedal which is connected to the ratchet device by means of suitable rods and bell cranks, and a hand pump for priming. The ratchet has two pawls, one of which is connected to the operating pedal and the other to the motor shaft, in such a manner that if the motor ignition should be advanced when starting is attempted, the starting pawl will be thrown out of engagement by

the other pawl, allowing the motor to rotate backward. The priming pump, located where it can be most easily reached by the driver, takes gasoline from the main supply line, sprays it and forces it to the cylinders of the motor through distributing pipes.

In starting the motor with the Simplex device, the cylinder is primed by the use of the pump, and the shaft then is rotated by pressure on the pedal, so that the effect is practically the same as when the motor is cranked by hand. In case the motor does not start at the first turn it can be turned over again by means of the pedal and ratchet, and if for any reason the carburettor does not supply a good mixture and keep the motor going after the priming charges have been burned, the pump can be operated to keep the motor going until it is warmed up and the carburettor does its work properly. Everything is done without the necessity for the driver leaving his seat, and no conditions are likely to

arise, so far as the apparatus of the starting device is concerned, which would require the driver to leave the car.

Curious Complications Follow Garage Fire.

Curious complications have arisen as a result of a fire which occurred a year ago in the garage of the Roseville Motor Co., of Roseville, N. J., which leased the garage, together with adjoining premises, from the Sayre estate. The place is held on a 10-year lease, which has four years to run, and the part not occupied as a garage is sublet by the garage owners. Since the fire the motor company has refused to pay rent, claiming exemption on the ground that rent is not legally due until the place has been made habitable. On the other hand, the owner of the building claims that the lease is void, on the ground that total destruction by fire terminates all leases, and that the garage was totally destroyed, and seeks to oust the motor concern. This attempt, as well as several others based on different legal grounds, failed, and the Roseville Motor Co. persists in refusing to pay the rent of the building, which amounts to \$125 per month, but nevertheless regularly collects from its subtenant the amount of \$105 monthly.

GERMANY ON AMERICAN EXPORTS

Freight Rates Claimed to Affect Our Trade in Far East—Panama Canal Will Change Situation.

In an endeavor to ascertain the possibilities of German automobile exports to Netherland India and the Straits Settlements, the Imperial German Consulate at Batavia, Java, has collected statistics which are not without interest to American manufacturers.

Calling particular attention to the astonishing increase of motor cars in the whole region, the consul analyzes the figures in detail as applying to English, German, French and American cars, and believes that the sole reason why European cars at present are so numerous in the East Indies and American cars so rare, is the exorbitant freight rates which American manufacturers located in Detroit and points further east in the United States have to pay for transportation of their product to the Pacific coast. Once ready for shipment at San Francisco, the American cars can compete successfully with the cheapest European prices, as there is not much difference between ocean freight rates from Germany or France to Singapore and those from the western coast of the United States. Carrying his investigations further, the consul finds that with the construction of the Panama Canal the American manufacturers will be in a position practically to dictate terms to the English and German shippers, and a fierce competition in those regions must be expected.

Owing to the peculiar circumstances attending the shipment of freight to Netherland India ports via Dutch steamship lines starting from Rotterdam and Amsterdam, it is almost impossible to obtain accurate statistics regarding the imports from the various countries of manufacture; only a small percentage of the total cars being shipped direct from the countries where they were made. During 1911 no less than 1,200 machines were imported, while the official registration figures for the island of Java alone show that on August 1, 1911, 2,282 automobiles were in use on the island. The rich planters and government officials are ready purchasers of cars, and the trying road conditions, the steep hills and devastating climate play havoc with the cars and their parts, making them short-lived and creating a steady demand for repair parts, accessories, and particularly for tires. Rubber does not last long in Java, and tires, of course, are especially subject to depredation; in proof of which statement the consul cites the fact that no less than \$200,000 worth of automobile tires were imported in 1910 to Javanese ports alone, at a time when only a little over 1,000 cars existed in the Netherland Indies.

Discussing the trade conditions and the granting of credit, the consul advises intending exporters of Java to be liberal, as the people requiring cars are perfectly capable of paying for them and may be trusted, in particular if they are administrative officials, or in any way connected with the government or large importing houses. Where full credit is not desirable, it is customary to pay two-thirds of the purchase sum when ordering the car, and the remaining third on arrival.

Commercial vehicles are not in great demand on the island of Java, but on Sumatra and Borneo their use is proposed in place of several projected railway lines, which it is feared would not prove profitable on account of the difficulties of building through virgin forest, and the slight traffic. Several regular passenger and freight lines already have been inaugurated between the ports and the great plantations in the interior, especially from Samarang and Soerabaya to the vast sugar factories in the northern provinces. The market for these buses and trucks steadily is growing and in time promises to exceed in importance that of the pleasure cars.

How Temperature Affects Tire Pressures.

Although it is best to err on the side of too much air, it nevertheless is detrimental to a tire to have it over-inflated as it is to keep it under-inflated. While it is always well to keep the tire inflated to the pressure recommended by the makers, this becomes especially important in the changeable weather of the spring or fall when the thermometer is likely to fluctuate over a great range in a very short period, since every change of temperature means a change of pressure in the tire. If, for example, a 36-inch by 4-inch tire is inflated to 90 pounds pressure at a time when the thermometer stands at 20 degrees, if the temperature rises to 80 degrees the pressure will register 100.5 pounds per square inch, which is higher than is recommended by makers. If the tube were inflated to the proper pressure, 80 pounds, at the lower temperature, the pressure at the higher temperature would have been only 88 pounds, or quite within reasonable limits. While the temperature change in the example may be considered too large to have taken place during the night in this climate, it must be remembered that the constant impact of the tire and the uneven spots on the roads also tends to heat the air, so that a change of temperature through a range of 60 degrees is not altogether impossible. Though tires ordinarily have a high factor of safety and will carry the extra pressure when new, though it is not to be recommended, the pressure in older tires should be kept within the limits prescribed by the manufacturer.

Obviously during the hot summer months, the tires on vehicles which are likely to be left standing in the sun should be under-inflated.

MAKING PLAIN THE CAR'S "INSIDES"

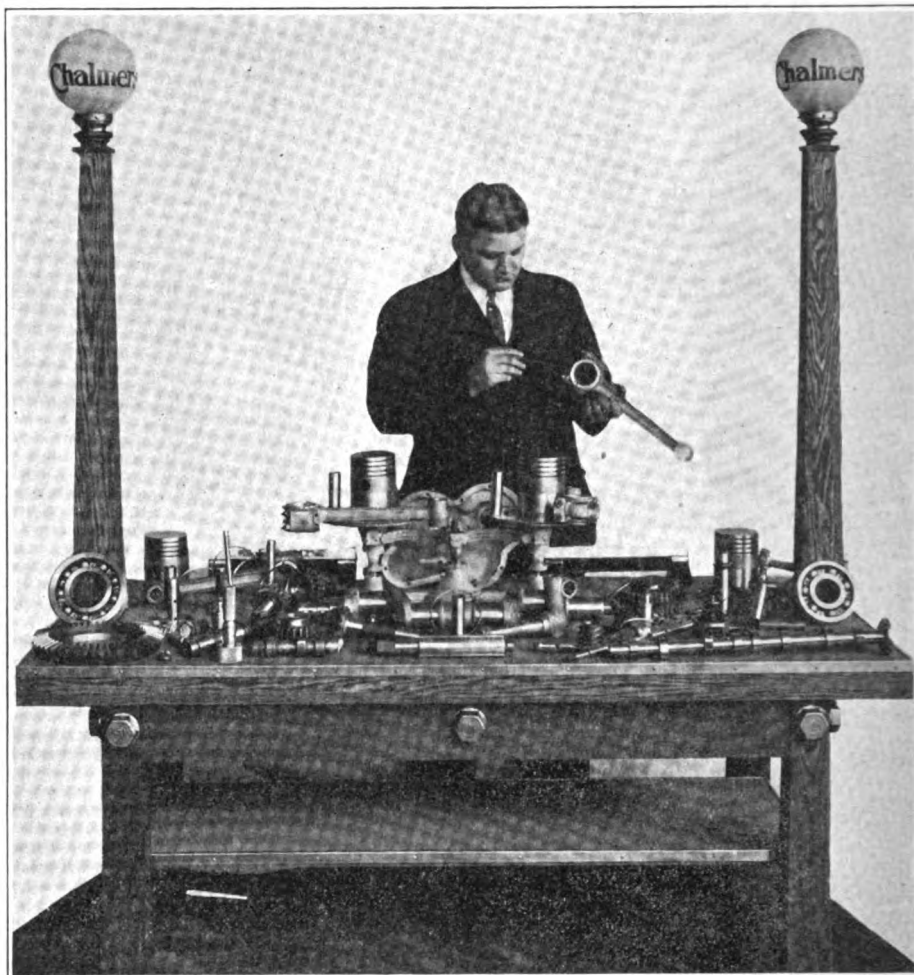
Chalmers's Educational Exhibit That is Spreading Knowledge—Parts and Demonstrations That Are Employed.

Not often is the layman let in on the secrets of automobile manufacture, and in particular the extreme accuracy and careful attention to the necessity for perfect balancing which is the rule in most modern

ings, etc., and a set of limit gauges as well, with which the demonstrator makes plain the very small limit of tolerance of the various parts. By way of indicating the accuracy which is insisted upon, the exhibit includes a pair of scales on which the perfect balance of pistons and connecting rods is demonstrated.

When Gas Starters May Fail to Work.

Due to the fact that acetylene gas is heavier than gasoline vapor, and when in-



CHALMERS EDUCATIONAL EXHIBIT WHICH IS ON LONG TOUR

factories, to the extent he or she is in the exhibit which just has been sent "on tour" by the Chalmers Motor Co., of Detroit, Mich. The exhibit, which is shown by the accompanying illustration, made its first appearance at the Boston automobile show, where it attracted considerable attention; since then it has been moved to other smaller shows and it is the intent of the company to send it all over the country, to be shown wherever there is an automobile show or a country fair. Accompanying the exhibit there is a demonstrator who lectures on modern automobile practice, with particular emphasis on the methods of testing parts which are in vogue at the Chalmers factories. The exhibit includes a complete set of the smaller parts which go to make up the engine, such as pistons, connecting rods, wrist pins, bearings, bush-

jected into cylinders and allowed to remain for any length of time settles at the bottom, there is likelihood of engine starters of the acetylene type failing to work, the reason being that the gas does not come in contact with the spark plug. In which case it may be necessary to "turn over the engine" by hand. One turn should be sufficient, however, as acetylene is a most efficient priming medium. Another thing which should be remembered is that an acetylene starter scarcely should be expected to start a new engine, which is stiff, every time without fail. Generally it requires that a car be run for a couple of hundred miles before the engine becomes "limbered up" sufficiently for an acetylene starter to live up to its reputation of 98 per cent. efficiency—a reputation which can be and is sustained.

MOTOR TRUCKS OF 1962; AN ENGINEER'S PROPHECY

Extreme Simplicity the Keynote of Commercial Vehicles of 50 Years Hence—Development Will Be Along Present Lines But Weight Will Be Pared and Many Other Things Undergo Alterations—Some of the Possibilities Dimly Distinguished by the Mind's Eye of an Engineer.

"Well," said the Designing Engineer, meditatively, "that's a good-sized order. You want me to shut my eyes, go into a trance and describe the ultimate development of the present type of gasoline motor truck. I suppose you know what I charge for my services?"

The D. E. was assured that he would be amply rewarded by the consciousness of having enlightened and interested his fellow men, to say nothing of the gratification he would derive from seeing his name in print.

"Nothing doing! Nothing doing!" exclaimed the D. E., throwing his hands in the air and figuratively going up after them. "If I do anything like that it'll be on the quiet and likewise sub rosa; I'm modest. Honest to goodness, I am! My name is 'Constant Reader' or 'Onlooker' or 'Veritas' or one of those things, you know."

Gentle persuasion having brought the D. E. down again, he settled himself in his revolving chair, gazed into the haze of tobacco smoke and made a tentative start.

"I don't have much time to let my imagination run loose," he said. "The nearest I can come to it is to mentally follow into the future the lines that I already know. The truck I know is a machine with a reciprocating gasoline motor at the front end, driving wheels at the opposite or rear end, through gearing which permits changing the relative speeds of the motor and the rear wheels. It has a frame of I-beam or channel steel and is carried on rubber-tired wheels. Now, while the truck of the future may be something very, very different from this—heaven only knows but that it may be an aeroplane!—I haven't enough imagination for that sort of thing. It's my own private opinion that it will be many a long decade before the possibilities of the truck of the general type that we now use will be all worked out. There will be lots of changes, though, in important details.

"The point is this: Granted that the truck is a pretty good thing, in a general way, just as it is, but that it leaves something to be desired, what are those desirable things? What have we done that we would rather have undone, and what have we left undone that ought to be done? Of course, the first thing to attack is the poor old motor; it's the motor that always gets the first kick. Well, what is there about the motor that there is any possibility of getting rid of without spoiling it? Lots of things. The whole blooming water-cool-

ing system might be thrown out, for instance. That would do away with a good deal of weight; it would make the motor a little cheaper to build; it would do away with 'freezing up' in the winter; it would be a good thing for quite a number of reasons. Air-cooling—"

"But if air-cooling is such a fine thing, why don't they use air-cooled motors in all trucks now?"

"There you go, right off the track! You forget we're talking about what may be done in the future—not what is being done now. We're figuring on the possibility of evolving an air-cooling system that will leave no room for controversy in the truck field; we haven't reached it yet, you know, thought there certainly are good air-cooled trucks built. But I consider it a possibility, and a very desirable one at that. Then there's the valve system. Just think of a commercially perfect motor with no valves and no valve gear of any kind—why, it would—well, it would be all that the two-cycle motor enthusiasts hope for, and that's a good deal. Of course, I'm assuming that it will not be necessary to sacrifice flexibility, or economy or anything else in order to gain simplicity. The two-cycle motor will make it possible to do without any lubricating apparatus whatever. Plenty of two-cycle motors today are lubricated only by oil mixed with the gasoline. It works. That leaves nothing complicated about the motor but the ignition system—unless you call the carburettor complicated; I guess it is, at that, judging by the way it cuts up sometimes.

"As to the ignition, I don't know just what I think, so to speak. Take a first-class ignition system with a good magneto, and it isn't exactly the acme of simplicity, and it doesn't seem to be developing in the direction of simplicity so that you can notice it. A dub can't do anything with it if it goes wrong—it takes a fairly good man to locate and remedy real ignition trouble, as a rule. As I say, my imagination is not particularly well developed, and my ideas don't run much out of more or less beaten tracks, so I don't know what to say about ignition. But I have a notion that each cylinder might have some sort of a small, simplified magneto of its own, operated, maybe, by a little piston moved by the compression of the charge in the cylinder—a sort of combination magneto and plug, with no wiring and no outside mechanism. There are individual magnetos made right now, and in service, and

there also are plugs which carry their own coils; but maybe time will bring forth a combination of the high spots of both these devices. I'm inclined to consider it a possibility, anyway.

"As to the carburetters, a whole lot depends upon the fuel that future generations will use to mix with the air they burn in their gas motors. It looks as though gasoline would be out of the running by the time the machines built today are conspicuous as museum curiosities and antiquities, and it's a toss-up whether it will be kerosene or alcohol. Both require extra heat, especially kerosene. Alcohol must be burned in a special high-compression engine to be economical, but kerosene needn't. Kerosene needs a whole lot of heat, and as it is used at present it is necessary to start on gasoline in order to get up the temperature before turning on the kerosene. But I don't see why the extra tank can't be got rid of by another scheme. It goes without saying that the great-grandsons of the truck drivers of today will not know much about cranking a motor; they will have motor starters. Now suppose they use an acetylene system—or some gas similar to acetylene—for starting, what's to prevent their running for a few minutes on the gas until things are warmed up enough for kerosene? That would cut out the extra fuel tank, and they would need the gas tank anyway for lights. The same goes for alcohol, though the extra heat needed doesn't amount to so much in that case.

"But there's another idea that looks as if it had possibilities. I see they have been experimenting out West with a car run on natural gas stored in a tank under pressure, and simply mixed with air and passed to the cylinders. Now, why wouldn't the development of that scheme be just the thing? Find a gas that can be cheaply manufactured, safely carried under pressure, and the carburettor is replaced by the simplest kind of a mixing valve. A good reducing valve in the line would of course take care of the pressure. There certainly are possibilities in sight in that direction. You can see for yourself that there are possibilities—I guess probabilities wouldn't be far wrong—along the lines of kerosene and alcohol development and the gas storage system, to say nothing of new ideas that may be brought out.

"Take the engine as a whole, now! I guess we are pretty safe in assuming that there will be as much improvement in the

next fifty or sixty years as there has been in the last fifteen or twenty. So we can count on better material, better wearing qualities, improved workmanship and a few other 'betters' that engineers will work out. Greatly improved efficiency ought to be one of the 'high spots.' Take all this with the elimination of the water cooling system, the valve system, the extra lubricating mechanism and so on, and the result ought to be an engine of considerable lightness and capable of running at pretty high speed without undue wear and tear. Four two-cycle cylinders would give constant torque and practically no vibration, and the reciprocating parts would be very light. With a light, smooth-running engine and an absence of sudden jars and shocks, a certain amount of weight could be saved in the framing, and high engine speed would make for lightness in the construction of the entire transmission system.

"But that leads up to another point. Suppose, by increasing efficiency, increasing the safe working piston speed, increasing the life of wearing parts, and so on, posterity manages to build a truck engine that will weigh half as much per horse power as anything we can turn out now. It seems to me that the idea then would be to use a good big motor and run it well within its limit, so that there would be a great reserve of power, and the change-speed gear could be reduced to give only two speeds, the lowest of which would be used only for emergencies and for exceptionally bad hills. Perhaps even a single speed would be enough—direct drive with just a clutch, like some of the steam cars. That would mean more simplicity, less weight, less to get out of whack, and cheaper construction—though, of course, the bigger engine would offset these advantages to some extent. But on the other hand, the increase of useful life resulting from running far below maximum would be a matter of no little importance.

"It is pretty safe to assume that there will be a whole lot of improvement in the materials used in frames—which means increased strength and less weight—and that the weakening effects of making holes for rivets will be avoided by some welding process, electrical, oxy-acetylene or the like. The same process should apply to most all parts under strain that are permanently united."

"Great stuff!" remarked the interviewer. "Now what about rubber tires?"

"Declined with thanks!" responded the Designing Engineer. "Maybe, though, light weight will encourage the use of pneumatics with some sort of a protecting tread. Then there always is the resilient wheel in the background. I wouldn't be surprised—if I had a chance—to see something good come out of that much-invented thing. Anyway, I don't believe my last sleep will be disturbed by the rumble of metal tires on motor trucks. I think there always will be some sort of a cushion be-

tween the wheel and the road. But, as I told you, I'm not doing a lot of pure imagining, and I can't figure what we'd do without rubber.

"Now, think it over! Every point I have mentioned is right in the line of present day development—quite a distance ahead, I admit, but nevertheless logically in line. We have good two-cycle motors, and they are getting better. We have good air-cooled engines, and they are improving rapidly.

"We have two-cycle air-cooled engines, and the people who make them are doing well with them. We have used kerosene, alcohol and compressed gas as fuel, and we know that we have not come anywhere near their possibilities in the matter of power and economy. All sorts of materials are improving every year. New processes crop up every little while to help things along. So you see there is reason for my belief that a good truck—yes, a darn good truck—can be figured out without any recourse to pure imagination. Just figure that what has been done can be done again, that as much progress as has been made can be made again—though probably it will take more time, for things are apt to move pretty fast in the early stages of any industry, at least after it is worth styling an industry.

"But if you want to go into the realms of rotary motors with no reverse gears, power plants so light they have to be ballasted to keep them down, and all that sort of thing, you'll have to try somewhere else, old top. I dare say we'll get to the rotary some day, but it will be when the reciprocating engine has had the last ounce of work squeezed out of it; but don't worry—our names will be worn off our tombstones before that time."

Superiority of Aluminum for Jigs.

Despite the state of perfection to which jig and template work has been brought in some of the larger American factories, and the accuracy which is possible with such modern methods, there still exists the drawback that the removal of heavy cast-iron jigs such as generally are used is a comparatively lengthy operation which in not a few cases requires special apparatus. Recently, however, attention has been drawn to the possibility of using aluminum in place of cast-iron, particularly for drilling jigs, and a British engineering firm has instituted an aggressive advertising campaign to educate manufacturers up to the advantages of the lighter metal for such purposes. Not the least of the advantages of aluminum is that there is considerably less variation due to the rise and fall of temperature than there is with cast-iron.

New Method of Enameling Small Parts.

A commercially practical method of enameling small metallic parts, irrespective of their shape, and in doing so to obtain a

"skin" of protective material of uniform thickness and adhesiveness, long has been sought, and it remained for two German chemists, Septimus and Albin Sonntag, to solve the problem with a system which is said to be both simple and certain. The surface of the object to be enameled is uniformly moistened by placing the object in a vapor bath, the composition of which remains a secret, or playing upon it a stream of vapor. Dipping the object in a solution, it is explained, does not produce uniform moistening for the reason that metals are apt to repel unatomized liquids. Enamel powder then is strewn over the object through a sieve and sticks uniformly all over it; to put on a second layer of enamel powder the process of moistening and sprinkling is repeated. After the powder is laid on, the object is placed in a furnace, as is customary in japanning. It is claimed that the absence of fluxes or binders of any kind helps the enamel to preserve its color, brilliancy and transparency.

Magneto That Lights Workmen's Pipes.

Matches are expensive in France, and as a result they are not wasted. In fact, in the Darracq factory, the workmen have adopted an ingenious substitute with which to light their "jimmy" pipes. It is a discarded magneto screwed down beside a can containing a small quantity of gasoline. The modus operandi necessitates that a screw-driver or other tool first be dipped in the gasoline and then held between the spark gaps of the magneto while the armature is rotated by hand. The sparks light the gasoline on the tip of the tool and it burns a sufficient length of time to enable the workman to light his pipe.

Where Two Wires Are Not Necessary.

There is small reason for running two wires to the lamps on an electric lighting system if the source of the current which supplies the light also supplies the ignition system. The ignition system being grounded, the second wire is of no practical use. A well insulated cable and good grounds to the frame proper are all that is necessary. The second wire chiefly serves to make the location of trouble in the system a little harder. It is of the utmost importance that the ground connection be well made, with good electrical contact and a secure fastening which will not be loosened by vibration and open the electrical circuit.

To Reduce Size of Copper Tubing.

When it becomes necessary to reduce the size of copper tubing so that it will enter the hole in a fitting, it can be readily accomplished by means of a tap wrench. Simply place the wrench over the tubing and slowly set the adjusting screw, revolving the wrench at the same time. Care should be exercised in setting up the wrench screw, however, so as not to pinch the tube.

WOOD TIRES THAT WOULDN'T WORK

Interesting Experiments in an Endeavor to Find Substitute for Rubber—Effects Proved Unhappy and Expensive.

It is within the bounds of possibility that the time will come when motor trucks can dispense with rubber as tire material, using instead something that is less expensive, either because it actually costs less or because its superior durability makes it cheaper to use, even though costly intrinsically. But it is quite certain that at the present time rubber is almost as essential to the profitable operation of commercial vehicles as is steel, and all attempts to oust it from its supremacy have come to naught.

While the search for something that will make the solid rubber tire a drug on the market continues, it seems to incline toward rubber substitutes and spring wheels rather than to tires made of substances unlike rubber. Wood tires at one time received considerable attention from the truck manufacturers, many of whom gained a good deal of expensive wisdom in the course of sundry experiments, and abroad this attention appears even more pronounced. Curiously enough, however, the attempt to use wood for tires has not been wholly confined to commercial vehicle builders and owners. Years ago, when pneumatic tires were not nearly as good as they are at present and when motor cars were coming into such wide use that the complaints of users concerning tires often partook of the nature of loud and long-drawn howls, there appeared in a magazine an advertisement from a genius who offered, for a stated compensation, to fill old tire casings with a substance which, while not as resilient as air, would keep the tires fully distended and enable the car to run on them until they were actually worn into rags—or words to that effect. Evidently there were answers to that ad., for it was not long before a motorist who had patronized the advertiser wrote an indignant letter to the editor, setting forth that the advertised tire-filling consisted of a lot of maple blocks sewed in the casing, and further averring that the action of the car on the tires so filled differed widely from anything he had previously experienced. There was a warm interchange of published letters, in which the tire filling genius fell back on his statement—which apparently was quite veracious—that his filling was not as resilient as air, and that the filled tire could not collapse.

With the exception of this instance, however, experiments with wood tires seem to have been confined to commercial vehicles. Unfortunately, many of these experiments have been made with vehicles that were not in regular, every-day service, so that

accurate data as to the value of the wood tires could not be obtained; but in some instances the trials were worked out to a conclusion, and the results were discouraging, to say the least. In one case the machine experimented with was a heavy electric truck, with a capacity of seven tons. The makers, naturally wishing to do everything they could to bring the operating costs of their machines to a low figure, decided to make experiments with tires made of wood blocks. Several sets were made up of different kinds of wood and placed on the wheels of trucks that were going into service.

The trucks were four-wheel drive machines, and all four wheels were used for steering as well. The wheels were 36 inches in diameter. The blocks of which the tires were made were about 7 inches wide—that is, when in place they formed a wood tire of that width. The depth from felloe to circumference was about 5 inches, and the blocks were cut so that the grain ran radially. Two steel retaining rings held the ring of blocks in place, bolts passing through both rings and holes bored in the blocks. When the nuts were pulled down tight the rings clamped the blocks together and at the same time gripped the edges of the felloe, there being grooves to take the edges of the felloe and lips which fitted over shoulders on the blocks. Steel cleats riveted to the faces of the felloes entered grooves cut in the blocks to prevent the tires from slipping on the felloes. The blocks were boiled in oil to exclude water; but it was found that this practice made no appreciable difference in the performance of the tires, so it was discontinued after the first few sets had been made.

The first of these wood-tired trucks was sent to a town where its work kept it nearly all the time on dirt roads, and the results obtained were very encouraging, though there was some little trouble with the commutators of the electric motors because the vibration caused the brushes to jump, and it was sometimes difficult to keep the commutators in perfect condition. On the whole, however, the experiment worked fairly well, and much was forgiven because of the large saving over the cost of rubber tires.

New York City was the scene of the next experiment in this series. Failing to appreciate the difference between dirt roads and the hard pavements of New York, the truck was fitted with a set of elm tires and was put to work hauling coal. It so happened that the machine was operated mostly over Belgian block streets, some of which were in poor condition. The very first day's work played such havoc with the elm blocks that a lengthy telegram went to the factory. The answer was a new set of blocks of hard maple, which were put on and which were quite an improvement over the elm tires; they lasted fully two weeks. Oak and hickory also

were tried, but gave only little better service than the maple.

Then ensued a series of experiments with a view to "armoring" the tires. The first scheme tried consisted of running the truck through a pile of steel lathe chips from heavy cuts on big work. By running the truck repeatedly back and forth through piles of spirally curled steel shavings the metal was forced into the wood until the blocks were filled with innumerable steel wedges which considerably hardened the wearing surface and kept working in as the tires wore down. This scheme really helped considerably, and another week was added to the life of a set of blocks. As three weeks hardly seemed an adequate span of existence, even for a set of wooden tires, however, the experimental work was carried further along kindred lines. Among the steel chips there happened to be a few rings of iron—scrap bits cut from iron pipes—which embedded themselves in the wood. The appearance of the tires at the points where these rings worked in led to the experiment of filling a set of blocks with bits of pipe or all sorts and sizes, hammered into the wood as close together as was practicable. This worked a trifle better than the steel chips—but not much. Not quite discouraged, though somewhat disheartened, the unfortunates who were carrying on the experiments tried one more stunt. A new set of tires was filled full of 2½-inch wire nails, driven into the wood very close together. It took nearly a keg of nails to do the job, and when it was finished the tires looked as though encased in little steel scales. But from that time on the "white wings" on the streets traversed by the machine wondered where all the nails were coming from, for in two weeks half a keg of nails was spread over the length and breadth of New York, and the tires lasted a little more than three weeks.

At this juncture the factory stepped in with a new idea. A set of blocks was shipped with a set of steel plates, the plates being inserted between the wood blocks, standing on edge crosswise of the tire. This proved to be the best plan of the lot, but the best that could be done was to run about five weeks on a set of tires with the steel plate inserts. So the whole thing was abandoned and no formal analytical report was required to prove that the experiments had been total failures.

Apart from the failure of the tires themselves to stand up, the excessive vibration set up by the almost unyielding wood caused considerable mechanical and electrical difficulty. The most serious trouble was that the brushes would not stay on the commutators—the same difficulty that was experienced with the first wood-tired trucks sent out, but in a greatly aggravated form because of the very unfavorable character of the street surfaces. With the brush-holder springs at normal tension the brushes would dance on the commutators,

forming a little arc and a black spot on the copper at every jump, until at the end of half a day's work the commutators would be entirely blackened; the carbon coating, having a comparatively high resistance to the passage of the current, would cause the commutators to heat, and the heat would spread to the whole armature, keeping the motor abnormally hot, and, in one of two instances, melting the solder by which the armature coil leads were secured to the ends of the commutator segments. The brush springs were tightened as much as was practicable, and the trouble was in some measure lessened; but it was found that if the springs were made sufficiently tight to make jumping impossible, the brushes wore down with great rapidity, as did also the commutators, owing to the excessive friction. So a tension was used which was an unhappy medium, so to speak—unhappy because the brushes and the copper wore quite fast and the commutators always were more or less rough at the end of a day's work over bad streets. In fact, the condition of the commutators in the evening always was a sure indication of the kind of road surfaces the machine has traversed during the day.

By the time it was decided that there was nothing to be gained by further struggles with wood-shod wheels, the whole truck was ready for overhauling—including the battery, which has suffered not a little from the terrible jarring it had received. In the meantime, however, the factory had shipped to another New York concern a second wood-tired truck which was to operate mostly over asphalt. The first set of blocks lasted for about two months, but the second set, made by the users of the truck from a specially fine lot of white oak, ran for about six months. There always was considerable difficulty on account of vibration, however, and the power required to move the machine on wood tires was considerably in excess of what would have been required with rubber-shod wheels. The result was that the mileage radius was insufficient, and this, together with the difficulties caused by vibration, resulted in the abandonment of the use of the machine.

The inevitable conclusion drawn from these experiences is that while wood tires may be of advantage under certain conditions particularly favorable to their use, they are useless for general use because they lack durability, are not sufficiently resilient and are wasteful of power.

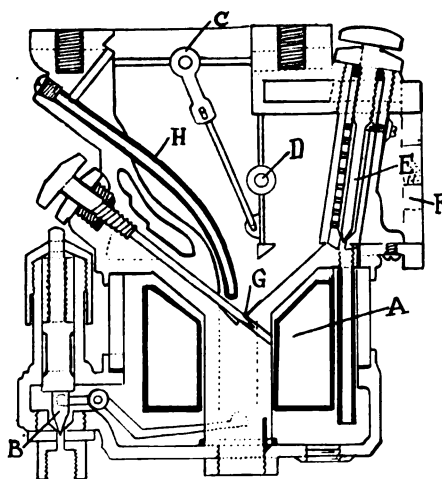
Where Use of Lead Washers Is Advisable.

It is not wise to use a fiber or composition washer in the unions or fittings on the fuel line, as the gasoline has a solvent action on them. With the fiber washer an accumulation of fluff powder will be noticed at the jet after the washer has been in place a short time, and this has a tendency to make the motor run sluggishly. Lead washers are much better.

CARBURETTER WITH TWELVE JETS

New England Invention Also Includes Two Linked Throttles—Formation of "Puddle" Constitutes a Feature.

Broadly speaking, a carburetter is a device for mixing a liquid fuel with the correct amount of air to make an explosive mixture. While the invention of a device which will give perfect results on a gas engine where the speed is invariable is a comparatively simple matter, where an automobile motor with its constantly varying speed and load, and consequent change in air velocity introduces such a number of complexities that it is not so easy to evolve a simple instrument which will feed a con-



KENNEDY CARBURETTER IN SECTION

stant proportion of gasoline vapor and air under the varying conditions. The end has been sought in a variety of different ways by the very many manufacturers of automobile carburetters, and each gives to his device a curve here and an angle there, or an adjustment here and another there, so that really a carburetter would not know its own brother without an introduction. That every little curve and adjustment has a meaning of its own, however, cannot be denied, and taken all in all, the carburetter family is really not so complex as might appear, and roughly may be divided into two classes—the single jet and the multiple jet.

The newest addition to the multiple jet class made its appearance at the Boston motor truck show last week and is the invention of J. C. Kennedy, of 903 Boylston street, Boston. It will be manufactured by the Kennedy Carburetter Co., which is in process of organization.

The device, which is illustrated herewith, is novel in that, although of the multiple jet type—twelve jets are in operation at high speed—it has but two needle valves for the control of the gasoline flow to these jets. G is the slow speed jet or ori-

fice, which allows the formation of a "puddle" in a recess at the bottom of the mixing chamber. E is the needle valve which controls the flow of gasoline to the other eleven jets which are arranged horizontally one above the other in a tube which crosses the air inlet F diametrically. C and D are two butterfly throttles linked together so as to operate in unison. A and B are the float and the check valve respectively which control the level of the fuel in the float chamber. The *modus operandi* is as follows: the throttles C and D being closed at starting, all of the air entering through the inlet F is forced to pass over the "puddle" formed at G and through the by-pass or duct H to a point above the throttle C. The level of the gasoline in the puddle is such that a slight amount is sucked up into the duct and vaporized as is the case in a surface carburetter, which provides an abnormally rich mixture for starting.

As the throttles C and D are opened, the reduced air pressure in the mixing chamber causes the liquid to rise in the multiple jet tube controlled by valve E, until at high speeds the level is such that all of the eleven jets are in operation, and very little of the air passes over the "puddle." The level of the fuel in the float chamber is readily visible by virtue of the glass cylinder which forms the chamber proper; the bottom brass casting which incorporates the check valve chamber and the top casting or mixing chamber are held together by an internal bolt which passes down the center of the hollow copper float. The carburetter is water jacketed to reduce winter troubles to the minimum.

No Duty on Motor Buses in Uruguay.

According to an order of the government of the Republic of Uruguay, South America, motor cars seating more than eight persons and intended for public use are to be admitted free of duty until further orders. The chief reason for this removal of the hitherto excessive customs duty on this style of motor vehicles is the intention of the government to establish and encourage the use of intercity motor buses in the regions of the country where railroads are unknown but where the resources of the country could be developed better if satisfactory traffic facilities were installed. In connection with this order the government also announces an international contest for motor-propelled agricultural machinery and farm vehicles, which is to be held during the months of April to October of this year.

The Best Way to Cut Gaskets.

In cutting asbestos gaskets, the best results can be obtained by cutting about half way through on one side and then finishing by cutting from the other side. The central opening should be cut out first in order to obtain clean, sharp edges and to reduce the possibility of fractures.

ROTTEN PLANKING LEADS TO LAW

Responsibility for Defect in Abutting Driveway Raises Unusual Points—Decision of Lower Court Reversed.

Since heavy motor trucks have come into more general use on the highways outside of paved and asphalted streets, the question of making bridges and culverts on or abutting such highways stronger than has been necessary heretofore, has become of paramount importance. On several occasions the courts have decided that the county or town authorities are responsible for the conditions of the highways and bridges connecting them, but never before, as far as known, has the Appellate Division of the New York Supreme Court been called upon to fix the responsibility for private driveways connecting such public highways with private property along the road. Such a ruling, however, has been made in the case of Helen Margaret Ferguson against the Town of Lewisboro, N. Y., in which the plaintiff sued for damages for injuries sustained while being driven over a defective culvert connecting the main highway with the abutting driveway leading to the property of one Silkman.

The case was argued in the Supreme Court for Westchester county and a verdict in favor of the defendant was rendered, against which decision the plaintiff appealed to the Appellate Division. The justices of the Appellate Court, in an opinion written by Judge Carr, and concurred in by Justices Jenks, Thomas, Woodward and Rich, reversed the decision of the lower court and granted a new trial. The opinion is as follows:

"The action was brought to recover damages for a personal injury on the theory that the defendant had been guilty of negligence in failing to keep in reasonably safe condition a part of a public highway. The proofs taken at the trial would have required the submission to the jury of the question of the defendant's negligence were it not that the learned trial court was of opinion that the defendant town had no statutory duty as to the point on the highway where the accident in question took place. The plaintiff was an infant of two or three years of age, and was one of a party which occupied a carriage which was being driven on to the traveled portion of the highway from private property adjoining. The highway as constructed and maintained was bordered by a ditch which had been made for the drainage of the highway. The roadway was constructed originally by the State, and was macadamized in the part intended for general travel. At the point where this accident happened the State contractors, in accordance with their contract, laid a wooden driveway across the ditch in order to provide access

to the farm of one Silkman, which abutted the highway at that point. This driveway, or 'bridge,' as it is termed in the briefs on this appeal, spanned the bordering ditch, which was about two feet wide, and extended along the side of the road about twenty-four feet, its width being about six feet. The planking and timbers had been allowed to rot, and the horse drawing the carriage in which the plaintiff was a passenger, stepped into or made a hole in the rotten planking and fell, thereby causing grave personal injuries to the plaintiff.

"Some months before the accident, the town superintendent of highways had sent some men to the place in question to remove the planking temporarily for the purpose of cleaning out and restoring the original ditch which had been choked up with sand. These men were instructed to re-lay the planks as they found them. The planks were found by them at that time to be rotten and the town superintendent was then so informed. He did not call this matter to the attention of the town board, and no repairs were made thereafter by the town or the abutting owner. The rotten condition of these planks was the proximate cause of the accident in question. The plaintiff and her companions were lawfully on the highway and they had no connection with the abutting owner, whose premises they had visited for business purposes. At the time of the accident they were ordinary travelers on a public highway, and the cause of the accident was a condition existing entirely within the highway lines, though not within the traveled or macadamized portion thereof.

"By section 74 of the Highway Law, every town is 'liable for all damages to person or property sustained by reason of any defect in its highways or bridges existing because of the neglect of any town superintendent of such town.' It was urged, however, at the trial that as this wooden driveway was intended and used as an approach to and from the highway for the benefit of the abutting private property, no duty in relation thereto was cast upon the town superintendent by statute. This contention is based upon the provisions of section 71 of the Highway Law, which provides as follows: 'The owners or occupants of lands shall construct and keep in repair all approaches or driveways from the highway under the direction of the district or county superintendent, and it shall be unlawful for such owner or occupant of lands to fill up any ditch or place any material of any kind or character in any ditch so as to in any manner obstruct or interfere with the purposes for which it was made. The town superintendent may, when directed by the town board, construct and keep in repair such approaches and the expenses thereof shall be a town charge.' It appeared at the trial that the abutting owner had not been directed by the district or county superintendent to make any repairs to the approach or driveway in ques-

tion. Likewise it appeared that the town superintendent had not been directed by the town board to make any repairs thereto.

"This action is brought against the town itself, and whether it be liable must be determined under the statutory provisions which impose liability, for at common law the town itself was not liable under such circumstances. In order that the town may be held liable for a 'defect in its highways or bridges' such defect must be 'existing because of the neglect of any town superintendent of such town' (Highway Law, sec. 74). The defect here in question came about through lack of repair of the approach or driveway. The town superintendent, however, had no duty to make repairs to this approach or driveway as a town charge, unless so directed by the town board. Concededly, such direction was not given by the town board. Whether the abutting owner can be held liable is not before this court, as that person is not a party to this action. It is argued, however, that the town superintendent may be found guilty of neglect in failing to take steps to compel the abutting owner to put the driveway or approach in good condition of repair. Section 73 of the Highway Law provides as follows: 'The town superintendent shall bring an action in the name of the town against any person or corporation to sustain the rights of the public in and to any town highway in the town, and to enforce the performance of any duty enjoined upon any person or corporation in relation thereto and to recover any damages sustained or suffered, or expenses incurred by such town, in consequence of any act or omission of any such person or corporation, in violation of any law or contract in relation to such highway.' This section did not require him to make the repairs necessary and then to sue the abutting owner for the expense thereof, for he could not make these necessary repairs unless so directed by the town board (Highway Law, sec. 71). Nor could he proceed against the abutting owner to compel him directly to make repairs unless there had been a prior direction of the district or county superintendent requiring such repairs, and as it appears in this case no direction had been given by a district or county superintendent in relation thereto. The same statute which affixes liability on the town for a defect in the highway arising from the negligence of the town superintendent likewise renders the town superintendent liable over to the town for such damages as it may have paid or become liable for by reason of such negligence (Highway Law, sec. 75). Both sections of the statute should be construed together.

"There is, however, another aspect of this case in which personal negligence on the part of the town superintendent may, as it seems to us, be chargeable properly. Section 47 of the Highway Law imposes upon the town superintendent a general

duty of care and superintendence of the highways and bridges in the town. This general duty of care and superintendence requires a reasonable inspection of the highway from time to time. When the highway from any reason becomes unsafe, to his knowledge, as in this case, and if the circumstances be such that the action of the town board be required to remedy the defect, then, as we believe, he owes a positive duty to call the matter to the attention of the town board, so that the defect may be remedied. While no charge of negligence can arise against him if the town board neglects to act after he has informed it of the situation, yet a failure on his part to place the matter before the town board, when he has full knowledge, indicates a negligent performance of his general duty of care and superintendence, and the continuing defect may be said to be one 'existing because of the neglect' of the town superintendent within the meaning of the statute as above cited.

"We think that the judgment and order should be reversed and a new trial granted, costs to abide the event.

"All concur."

Dealers Involved in Old Lawsuit.

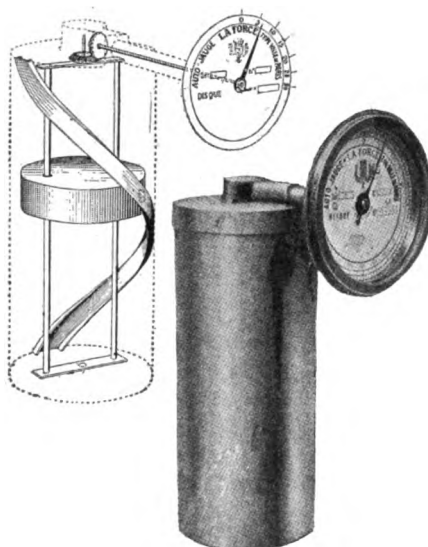
Although the suit entitled *Humphrey vs. Pope-Hartford Auto Co.* was to have been argued this month in the New York Supreme Court, no steps toward an airing of the dispute were taken and the case has been postponed until the fall term of the court. According to the attorneys for the complainant, who is Dr. Humphreys, of New York, the Pope-Hartford company is the innocent party in an involved trade with automobiles, in which one foreign and one domestic car played the most conspicuous part.

It appears that some time ago the 18-year-old son of Dr. Humphrey was out driving his father's car (a 1909 Peerless), when he fell in with a certain Charles B. Bowler, who possessed a De Dietrich of the vintage of 1908. It did not require much persuasion on the part of Bowler to induce the inexperienced young Humphrey to part with his father's Peerless car for the De Dietrich, whereupon the youth proudly took his "foreign" car home to show it to his father. The latter viewed the "exchange" with mixed feelings and ordered the boy to get the Peerless back as quickly as he could. That was easier said than done, for Bowler in the meantime had taken the car to the Pope-Hartford Auto Co. and traded or sold it there, and the Pope-Hartford people quite naturally declined to hand the Peerless back to the doctor when he called for it. The De Dietrich was returned to Bowler and a demand made for the money value of the Peerless car—which was fixed at \$4,000—in addition to \$1,000 damages which the doctor claims to have suffered by reason of being deprived of the use of his automobile.

GAUGE APPROVED BY A GOVERNMENT

To Lessen Octroi Troubles, France Lends Sanction to a New Instrument—How It Operates.

Though devices which serve to indicate the depth or actual quantity of fuel in a gasoline tank are not novelties, nor are they any scarcer abroad than they are on American shores, there has just been introduced in Paris a new type of gauge which is of interest chiefly because it is the first device of its kind, and the only one, ever to be accorded the official sanction of L'Administration de l'Octroi of the French capital. It is styled the Force automobile gauge, and E. Beaupied, of 13



"LA FORCE" TANK GAUGE

Rue Gide, a Levallois-Perret, Siene, France, who will control its distribution.

In Paris, the government has imposed an octroi, or town tax, on all gasoline and benzol which is purchased outside and carried into the city; on gasoline the tax is four cents a liter, and on benzol, which is almost exactly the same substance, it is two cents a liter. It is this tax which it is the duty of L'Administration de l'Octroi to collect, and if all people were honest in their declarations of the amount of fuel in their tanks the duty would not be such an arduous one. Unfortunately, however, everyone is not honest; the desire of the Paris taxicab chauffeur to evade the octroi is particularly keen, and when disputes arise there remains only the alternative of pumping the tank dry and measuring the fuel.

But the taxicab chauffeur is not the only one to suffer; not infrequently private owners are subjected to such "indignities" and time is wasted—the time of the owner, or the chauffeur, and the time of the officers whose duty it is to "keep tabs" on the contents of the gasoline tanks of migratory

motorists. It is to prevent such arguments and losses of time that the gauge has been invented, and so much merit has L'Administration de l'Octroi de Paris seen in it that it has decided to accept the reading of the gauge as prima facie evidence of the contents of the tank to which it is attached, once the gauge has been calibrated and certified "O. K."

As may be seen in the accompanying illustrations, which shows the device both in perspective and in section, the gauge consists primarily of a brass cylinder which reaches to the bottom of the tank. Contained in the cylinder there is a spiral pathway which serves to guide a float, which slides on two wires attached to the recording mechanism. As the tank is filled, the float rises and, because of its attachment to the spiral pathway, turns the recording mechanism, the movement being transmitted to the dial by means of tiny bevel gears. The dial is furnished blank, and it is merely necessary for the purchaser to report to the proper authorities, when it will be properly calibrated gratis to show the contents of the tank in liters. Thereafter a glance suffices to indicate to the authorities the amount of fuel in the tank, and the tax is regulated accordingly. The gauge can be fitted to any tank, no matter what its location, and works equally well whether gravity or pressure feed is used.

"Confidence Men" Impersonate Drivers.

Joe Dawson, the Marmon driver, Howard Wilcox, of the National team, and Dr. Chas. G. Percival, the conductor of Abbott-Detroit "Bull Dog," all have been recent victims of impersonators. The seconds of Dawson and Percival are in jail, while Wilcox's double seems content to resort to less incriminating measures and, as far as known, has failed to forge any bad checks. The chap who "borrowed" Percival's name is one C. G. Bonner, of Victoria, B. C., who not only represented himself as the man who drove the "Bull Dog" to the Arctic Circle, but succeeded in separating Frank E. Lee, of Dawson, Alaska, from a real mine on the representation of exchanging two Abbott cars. Bonner is held by the authorities at Spokane, Wash.

Paris's Troubles With Motor Mail Service.

That motor mail delivery is not always so profitable as optimistic contractors believe is the experience of the several companies which at various times undertook to handle the carrying of mail between the main and branch offices of the Paris post office department. The work was paid for on a mileage basis, with high speed, low rates and such unsatisfactory management that the last company holding the contract deliberately went into bankruptcy rather than continue the service. A reorganization of the system now has been effected and a new company has undertaken the thankless job.

FACILITATING THE TRUCK'S WORK

Handling and Hauling of Coal Cited as an Example—Motor Expert "Tells Things" to Coal Dealers.

Undoubtedly the most baffling problem in connection with motor trucking is not the production of vehicles capable of doing work of a given character, but the providing of conditions that will assist the machine, and not hamper it, in performing the best work of which it is capable. The first essential is a definite knowledge of operative costs of transportation by horses and by motors, so that intelligent comparisons can be made. These points were clearly brought out by William P. Kennedy, consulting engineer, who is at the head of the transportation cost bureau of the American Locomotive Company's automobile department, in a paper read at a meeting of the Retail Coal Dealers' Association of New England, held in Boston on March 14th last. As was quite natural, the problem was viewed from the coal dealer's point of view.

In opening his paper, Kennedy said:

"In attempting to supersede horse equipment in the transportation of coal with motor trucks, the vital question is whether the conditions of operation can be so modified as to permit of applying the machine to such an amount of its capacity as will reduce the present cost with horses. In other words, there is no question that, if conditions are arranged so that the machine can be permitted to operate for a sufficient period of the working day, it will readily effect a saving.

"There are at present many impediments to such machine employment, due largely to delays incident to making the delivery as well as the delays quite frequently experienced in loading at the coal yard. Unloading conditions present the greatest difficulties because they are usually beyond the control of the operators, but the yard conditions being absolutely in the hands of the coal operators, there should be no reason why the loading of coal cannot be accomplished with very short delay to the machine."

The fact that no type of coal-carrying body can hope to meet all the conditions encountered in making deliveries was referred to by the speaker as follows:

"In making deliveries of coal such a variety of conditions are encountered as to make it often difficult to determine whether the automobile body should be stationary with end or side inclined chutes, whether it should be a body capable of being lifted vertically, or whether it should be tilted at one end or possibly tilted and the body dumped to the ground, as is occasionally necessary in handling soft coals.

"All these types of body equipments on

machines are in use, as well as the scheme of handling a large quantity of coal on the semi-trailer equipment, which has the advantage of transporting the greatest portion of the weight over ordinary large diameter wheels with steel tires, but the final determination as to what class of body will be selected must be determined by the particular operating conditions for which the machine is intended."

The extreme difficulty of securing accurate figures relating to the cost of operating motor trucks as compared with operating horses on work of the same class was given due appreciation. Horse trucking costs, it would naturally be thought, could be obtained readily from any coal dealer operating on a fairly large scale, but such is not the case, the difficulty, accord-

have been divided by 150 to determine the cost chargeable to each active day, and on this basis the cost per ton would be twice that of the former.

"The whole problem requires segregation of those charges which are constant whether the vehicle is employed or not, and an additional charge for those items affected by activity added to the first or fixed charge so as to arrive at a true cost of unit performance, whether this latter be based on a tonnage rating or on a ton mile basis.

"It is quite possible in determining the operating cost of machines to follow a similar practice of separating the inactive or constant charges from the active charges and the total charge per day thus arrived at should be used in the determination of

TABLE OF AVERAGE ANNUAL COSTS OF OPERATING COAL TRUCKS

Machine Size.	2-Ton.	3½-Ton.	5-Ton.	6½-Ton.
Fixed Charges:				
Interest on investment at 6 per cent., and depreciation on non-wearing parts at 10 per cent.....	\$376.00	\$458.00	\$600.00	\$709.00
Maintenance:				
Wearing parts.....	346.00	420.00	487.00	495.00
Tires	358.00	519.00	757.00	886.00
Garaging:				
Storing and washing.....(variable)	(Assumed)	720.00	720.00	720.00
Garage labor.....(variable)				
Insurance				
Operation:				
Gasolene, at 10 cents per gallon.....	250.00	300.00	375.00	500.00
Lubricating oil, at 35 cents per gallon.....	39.00	75.00	105.00	119.00
Operator	(Assumed)	1,040.00	1,040.00	1,040.00
Helper				
Licenses				
Totals.....	\$3,129.00	\$3,532.00	\$4,084.00	\$4,469.00

Based on performance of 50 miles per day per truck, 312 working days per year.
 Total fixed charges, garaging and operator, 5-ton truck..... \$2,360.00
 Total fixed charges, garaging and operator, 5-ton truck, per day..... 7.56
 Total charges for maintenance, gasolene and oil, 5-ton truck..... 1,724.00
 Total charges for maintenance, gasolene and oil, 5-ton truck, per day..... 5.525
 Total charges for maintenance, gasolene and oil, 5-ton truck, per mile..... .11

ing to Kennedy, being due "principally to the variety of bookkeeping methods, wherever they exist, and the lack of any uniformity in cost per ton or other unit delivered. . . .

"The only safe and general way by which the cost per ton can be arrived at is by taking the entire year's cost of operation and upkeep and charging this to the total tonnage transported per annum, but we frequently find that only the current charges for the daily operation of the horse vehicles when in active service are charged against the transportation for the current day, and this data alone is the one with which machine operation is compared. Again, we find the reverse condition, as where an installation may be active twenty-six weeks of the year, while the total cost of the year in bulk is divided by 300 to arrive at the cost per day and this cost per day used as the basis of determining the cost per ton delivered for any day of the twenty-six weeks. As a matter of fact, the annual cost in this instance should

the cost of delivery per ton or per ton mile.

"To exemplify this the attached table may serve to show the charges influenced by service or inactivity. The items marked 'variable,' however, are dependent upon each operator's particular condition, and to cover charges for garaging and for operators we have assumed a figure of \$60 per month for garage and \$20 per week for labor. This table, with the total figures shown, is intended to cover a year's operation and a performance of 50 miles per day per vehicle.

"In this table it will be observed that on each size truck there is a figure for fixed charges, which includes interest at 6 per cent. and a depreciation of 10 per cent. on those parts of the vehicle which are not subject to wear and which are replaced or renewed under the heading of maintenance. Under the maintenance charge there is a figure for the upkeep of mechanical wearing parts and another for tires, and in the operating division there are figures cover-

ing consumption of gasoline and lubricating oil, operators and other incidentals to the cost of service.

"Assume that we are to determine the cost of operation of a five-ton truck which is employed the entire year. The items for fixed charges, garaging and operators are constant and independent of the tonnage or mileage performance of the vehicle. This charge against the vehicle while inactive will amount to \$7.56 per day, assuming 312 working days to the year, and the total of the maintenance items, together with the items for fuel and lubrication, can be resolved into a cost of .11 (11 cents) per mile, since this example is intended to cover a 50-mile performance each day for 312 days.

"Now, with the inactive charge of \$7.56 per day and the charge of 11 cents per mile, by multiplying the latter by the mileage performance of the truck on any particular day and adding it to the inactive charge of \$7.56 per day, we get the total cost for transporting the day's tonnage and in this manner arrive at the actual cost per ton.

"Assume that the truck covers 33 miles and delivers 31 tons. Thirty-three multiplied by 11 cents per mile equals \$3.63, the active charge, and this, added to \$7.56, the inactive charge, makes the total cost of the day's performance \$11.19, and since this day's performance is the delivery of 31 tons, we divide this figure by 31 and find that the cost per ton is 36 cents. In a similar manner any other performance can be calculated.

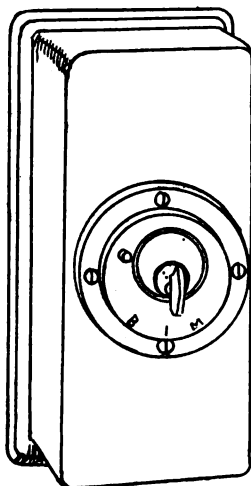
"In the event of the machine being used only half of the year the fixed charge of \$7.56 would be reduced by 50 per cent. of the annual charge for operator and a reduction of the garaging charge during six months to, say, \$5 per month, thus making the fixed charge for the days the machine is rendering service \$4.93 instead of \$7.56, and consequently reducing the cost per ton in the particular case cited to 27 cents instead of 36 cents.

"If for comparison against such machine cost we have a definitely known cost of transportation per ton with horses, it is quite possible to determine the performance limits of the mileage and the tonnage which the machine must accomplish to equal or better the horse cost."

When motor truck equipment is not in use all operating charges against it cease, leaving only the fixed charges for interest, depreciation and the like. "This," says Kennedy, "is not the case with the horse equipment, which must be fed and cared for almost independent of the service rendered, so that if the machine equipment were not used for six months of the year there might be a considerable reduction in expense over that required to maintain the horse equipment during the same period." While this argument in favor of motor trucks is a familiar one, its force rarely is fully appreciated.

Magneto Lock That Serves as Switch.

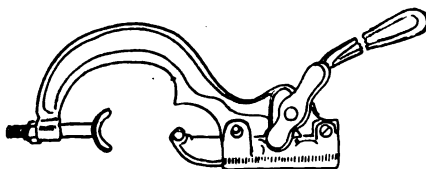
It is such an easy matter to replace the plug of a switch with a round bit of metal, such as a nail or a piece of stout wire, that no little ingenuity has been displayed in evolving switches capable of guarding the gap in the circuit against such unauthorized tinkering. Among the latest of these devices is the automatic lock switch manu-



factured by the Blackburn Specialty Co., of Cleveland, O., which incorporates a Yale lock in its construction, the key of which takes the place of the plug. The key, when inserted in the keyhole and turned to the right or left, closes the circuit and cuts in the magneto or battery; the central position is the "off" point, and the key cannot be withdrawn unless the current is shut off. Once the key is withdrawn the switch cannot be turned unless the Yale lock can be picked—a bit of burglar craft that is hardly worth attempting. When the switch is mounted on a coil box, the motor cannot be started even by short-circuiting the wiring, for in order to make a spark the current must pass through the coil, and it cannot do this without first passing through the switch. Even when the screws holding the switch to the coil box are withdrawn the case cannot be removed from the box unless the key is available. The switch is easily attached. Three keys are furnished with each one.

Tool That Assists Tire Removal.

One of the most disagreeable jobs connected with the use of automobiles is the



removal of a tire, and it follows that anything designed to lessen the irksomeness of the task is entitled to attention. The O-Tak-A tire tool, for which J. W. Grumiaux, of Le Roy, N. Y., is sales agent, is in this category. As the illustration shows, this

tool consists of a yoke, on one end of which is a crotch designed to seat on the rim, and on the other a plunger, actuated by a lever, the purpose of which is to force the tire retaining ring inward so that the locking ring can be disengaged. The leverage of the tool is such that the ring can be forced back without difficulty; the makers state that even a rusted ring will move promptly when the "O-Tak-A" is applied. When the lever reaches the end of its movement it automatically locks itself in place, holding the ring back, so that the operator has both hands free to take care of the locking ring. A push on the handle unlocks it at the proper moment. The device can be reversed and applied to the back ring if desired, and it can be used to remove tires whether the rims are on the wheels or demounted—a feature which should be of use in case of the puncture of the last spare tire on the road. The plunger cannot slip off the ring, as there is special provision made to guard against this. Two sizes of the tool are made, one for tires up to and including four inches and the other for tires larger than four inches.

To "Fish Things" from Cylinders.

When a metallic splinter or even a nut inadvertently falls into the cylinder, it is a rather simple matter to convert a file or screw driver into a magnet by placing it on the pole pieces of the magneto. Even if the magnetic attraction is not sufficient to lift the weight it can be easily guided to the valve pocket and so removed. When some non-magnetic substance falls in, however, such as a piece of porcelain from the plug, considerable "fishing" is necessary to remove it. The car can be jacked up on one side so that the piston top slopes toward the valve pocket, the valves removed. If the motor is rapidly revolved, the chip, or whatever it might be, will gradually work toward the pocket and pop out.

One Factory With Noise-Proof Room.

Most manufacturers of motor cars are taking great pains to eliminate noise from their machines, but the Hudson Motor Car Co., of Detroit, seems to have gone a step further in this direction than any one else. The factory is provided with a specially constructed sound-proof room, in which cars are tested for abnormal noises, the mechanism being driven by an engine located outside the room and power transmitted through an opening in the wall. The result is that the man detailed as noise detective is not troubled by outside sounds, and his trained ear is enabled more readily to locate unnecessary rattles and wheezes.

Universal Coverings That Require Care.

The leather covering of universal joints should be examined from time to time, for it is not unlikely that flying stones may have bruised or pierced them, not only allowing the escape of the lubricant but also the ingress of dust and grime.

THE MOTOR CAR AND ITS RELATION TO PULSE RATE

Foreign Physician Attacks an Old Bogie from a New Angle—Experiments Conducted to Discover the Influence of Motoring on the Health of Mankind—Pulse Beats as an Indication, the Effects Observed and Conclusions Arrived At.

The effect of motoring on health in general long has been a fertile field for medical investigation, and though some of them have given voice to opinions which are truly remarkable for their verbosity, some of them have been just as truly enlightening. It is a matter of common knowledge that any material modification of the routine of life must produce some effect on mental and physical conditions, and it therefore may be expected that motoring, being one of the modifications, must have some effect.

As to just what the ultimate effect may be, other than that health generally is improved, few physicians agree, though as a rule they are unanimous that the visible effect, during the continuation of the ride, is a quickening of the pulse rate, provided, of course, that the subject examined is normally healthy. Such, in brief, has been the experience of Dr. G. H. Lyth, who is a British physician of reputation, set forth in "Proceedings of the Physiological Society," and though the data, reproduced herewith, were obtained in a series of experiments conducted in part on a tram-car, the doctor points out that the same effects are noticeable when the subject is seated in an automobile. Following are the results of the several tests:

Average Rate Standing.			
	No. of counts.	In wind.	In shelter.
Air temp. 44°.....	5	87.2	77.6
North wind.....	8	84.5	73.5
Air temp. 65°.....	5	72.8	68.2
Fresh breeze.....	5	82.4	66.8

Average Rate Sitting.			
	No. of counts.	In wind.	In shelter.
Air temp. 37°.....	4		66.5
High N. E. wind....	4	95	
	4		76
Air temp. 70°.....	10	76.2	61
Cool sea breeze....	10	80.6	61.6

Average Rate, Traveling on Electric Tram-car, Sitting.			
	No. of counts.	Inside.	Outside.
Air temp. 42°.....	9	75.5	100
Air temp. 61°.....	11	76.7	
	12		81.3

Commenting on the tests, he says: "The effects of continued exposure to a cold wind, or to movement of the body through cold air may be progressive, e. g., during a ride in an open motor car the rate was found to rise gradually from 90 to 100 to 112 to 120 in the lapse of about an hour and one-half."

Of course the effect may not be the same on any two individuals, and by way of em-

phasizing the fact, and at the same time demonstrating that such increase of pulse rate as may take place is entirely normal and need not cause "needless alarm," a brother physician to Dr. Lyth cites in the Autocar some interesting data obtained as long ago as 1907.

"As an example of the small effect on the pulse rate of a hardened motorist," he says, "the wonderful 24 hours world's record of S. F. Edge in 1907, which is still unbeaten, may be cited. Just before the start, on an effort which many prophesied would end in madness or at least complete physical and nervous collapse, Edge's pulse was 74, and 24 hours later, after averaging 65 miles, 1,594 yards an hour and covering 1,582 miles, it had actually dropped to 70. The slower pulse, as both the medical men who examined Edge reported, was also a shade weaker than at the start. In short, as they said, he was a healthily tired man."

"It is well known," he continues, "that the pulse rate is not a constant—while sitting quietly it may be about 60 a minute, on standing up and moving about it rises to 70, while quick movement, such as a smart sprint, may bring the rate to 120 a minute within a very short space of time, so that, according to circumstances, the pulse will vary through quite a considerable range. The heart's action is stimulated by many influences, amongst which may be mentioned exercise, air, pleasurable emotions, etc., and, as all are not similarly constituted in regard to the strength and efficiency of their vital organs, those influences will not act alike on each individual."

"Whilst discussing the stimulating effect of rushing through the air in an open motor car with no wind screen, it must not be forgotten that habit and idiosyncrasy play a very important part in the matter. For example, the first drive in a car, as a rule, is a new sensation—possibly the individual has not yet learned the lesson of clothing properly—the heart, unused to such rapid stimulation, will do its level best to assist in keeping the heat mechanism right, and probably will be over-stimulated; a rapid pulse, and even discomfort may be the result."

"The experienced driver will also have noted that on a cold day a 10-miles-an-hour loitering is just about the best method of getting chilly, while if speed is increased a comfortable glow is the result—the proper degree of stimulation has been reached. And again, after the novelty of driving a

car has worn off, this rapid pulse rate is not noticeable, for the simple reason that the heart has got accustomed to the surroundings, so to speak, and does its work without any fuss whatsoever.

"The counts of a pulse taken of a motorist of long experience may be of interest. At start of drive 82, after half an hour 86, after a speed which shall be nameless (including the incident of passing a fast car on the level) 90, after one hour's driving 88. So that as before mentioned there is no hard and fast rule to be laid down—one man's meat another man's poison. Precisely the same conditions rule in the case of an athlete a little out of condition; at first even light exercise may increase the heart beat to discomfort (palpitation), later on as he gets fit heavy exercise is indulged in without any discomfort whatever."

"Now the heart is simply a muscle well supplied with blood, and we know that it is improved and strengthened by moderate exercise on the part of the individual; the data given have proved that motoring stimulates the heart's action, or, in other words, provides the organ itself with exercise under the most favorable circumstances—exercise which it certainly does not get under normal conditions. The prodigious work done by the heart is only possible from the fact that the organ alternately works and rests; there is a distinct pause between each beat, and, furthermore, when normal, adapts its output to the circumstances existing; while sleeping the beat is slow."

"Whilst on the subject of the circulation of the blood, it might be mentioned that the action of the heart has to do with the heat mechanism of the body; the body temperature remains constant in health—from 98-99° Fahr.—whether in the depth of winter or the warmest day in summer. After very strenuous exercise, however, the temperature may reach 101° for a short period. Even though one complains of "feeling cold or hot," the temperature as determined by clinical thermometer is the same and the organs work properly, provided that the internal temperature is kept at or about 99° Fahr., for should a fall or rise occur disorganization takes place and life may be threatened."

"Temperature is kept uniform by the control of (1) heat production and (2) heat loss."

"Heat production—All living tissues produce heat owing to chemical processes of oxidation which go on within them."

"Heat is specially produced in the mus-

cles; energy is set free by the breaking down of the muscle substance and the formation of carbon dioxide and water. A simple proof of heat production in this fashion is instanced by the case of a beehive; in cold weather when the bees are at rest the temperature may be at freezing point; if the bees are aroused to movement the temperature will shortly rise a matter of 20° or so. Every beat of the heart is spent in driving blood through the small arteries, and thus heat is produced; the circulatory system may be likened, in fact, to a hot water arrangement distributing heat to every part of the body.

In cold weather the heat production is increased, there is greater muscular activity, and the appetite is greater than in summer. Heat is lost chiefly from the skin: in cold weather the skin is constricted and sweat is diminished, thus reducing the loss of heat by radiation and evaporation.

"Heat loss is also prevented by wearing more clothes; when a hot body is surrounded by one or more jackets with a layer of air between each, heat loss is much lessened; it is said that a single layer of linen covering the whole body diminishes the heat loss by two-thirds. The warmth of a garment depends on the amount of air which is kept stationary by being entangled in its meshes; clothes prevent the loss of heat by convection, for the air, when warmed by the body, cannot rise owing to the garments which entangle it; air is a bad conductor of heat, thus several garments worn over one another may be made of light material, for the air which is entangled between them serves to keep the body at proper temperature.

"The motorist learns after a short period the nature of clothing best suited to keep him warm, and as a rule after a little experience even on the coldest day in an open car there will be no after effects due to exposure to the cold air. The parts which are most liable to chill are the hands and feet, and this is accounted for by the fact that after the blood has been circulated through the body it has to return to the heart again. Now for this return journey we have no pump in the proper sense of the term (though respiration assists greatly, deep breathing particularly), and we are dependent on the action of the muscles and change of posture.

"Following the course of the circulation once more, the blood passes from the heart through the large arteries, which are elastic tubes, thence to the small arteries, which are muscular in structure, and from these latter to the capillaries, then to the veins (which are wider than the arteries and are neither very muscular nor elastic), and so to the heart. It is perfectly evident that the extremities are the termini of the pumping operations, and it is only to be expected that the flow is apt to incline to stagnation unless proper precautions be taken. Note how difficult it is to stand still in a crowd for more than a few minutes;

one feels impelled to change position. Nature simply cries out for a change of position and we respond to that call, which is simply a request to move the muscles a bit and help the return flow along.

"In the up-to-date car with its elaborate skuttle-dash and ample wind screen much assistance is given to keep the extremities at a normal temperature, but owing to causes previously mentioned this is not always sufficient on account of the position of the hands and feet. Much has been done of late in the production of coach work built in such a manner that both driver and passengers can stretch their legs comfortably, thus assisting the circulation and also the heat arrangements.

"With the hands, however, it is different, especially for the driver; he must look after his wheel, but there is no earthly reason why that wheel should be gripped like grim death for any length of time, nor is there any reason why the position of the hands should not be altered. Movement is the golden rule for hands and feet in cold weather, and this movement can be performed perfectly whilst driving without conveying the impression of 'fiddling' to passengers. It must be remembered that the position of the hands whilst driving is as bad as possible for the venous circulation, and that circulation must be maintained somehow or other or extreme discomfort is caused.

"In spite of the fact that we are using our hands at all hours of the day, it must not be forgotten that that use is mechanical, and muscular development does not necessarily follow. The fingers usually chill first on a cold day, and it is noteworthy that those who are in the habit of using their fingers in such a fashion that the muscles and ligaments of the fingers are limbered and in good order do not suffer nearly so readily from chilled hands in cold weather; pianoforte players, for example.

"The proof that the fingers of the average man are not as they ought to be is shown by the fact of the unaccustomed handling of a tool for any length of time—filing metal, for example, usually results in the operator having to take a rest on account of the stiffness of the fingers which ensues; and, furthermore, one or two expansion and contraction exercises for the fingers will soon give an indication to the motorist whether his fingers and hands are as supple as they ought to be.

"To the lusty motorist who knows neither ache nor pain and who has accustomed himself to the vagaries of the weather by training and habit these lines may not appeal; unfortunately, however, there are cases, and the writer comes across them frequently, where winter motoring does cause discomfort in one form or another, and those discomforts, without actually reaching the length of ailments, are often pronounced enough to negative completely the good effects which ought to result.

"It may be seen from the foregoing that the increased pulse rate under normal circumstances is actually a benefit, stimulating the heart muscle, improving the heat supply, and furnishing the motorist with a general feeling of well being; it is needless to add that over-stimulation, persistent chilliness, and the like should be attended medically at once."

German Chauffeurs Must Be Unconvicted.

While all New York City and a good deal of the rest of the country is talking of the effects of the recent taxicab hold-up, in which two bank messengers were beaten and robbed of \$25,000—said effects to include a licensing bill for chauffeurs which would exclude chauffeurs who had ever been convicted of a felony from operating taxicabs or other motor cars in the State of New York—the German authorities are drawing the lines surrounding registration requirements still tighter. Only last week the provincial bureau for the province of Rhineland refused to O. K. the application of a trained, expert chauffeur, because it discovered that about seven years previous to his taking up the role of motor driver he had been convicted of assault and battery on four distinct occasions. The license commissioner decided that a man with such disregard of the law and such fighting proclivities could not be trusted with the operation of motor vehicles, despite his acknowledged expertness, as he must be considered lacking in that essential requirement of a good chauffeur—self-control.

North Carolina Idea of a "Stunt."

Driving automobiles with speed levers sealed, or with cows and calves in lieu of passengers, and bound for such near-by places as Chile, Alaska or Siberia—all these things are commonplace, because the cars are driven in the manner they were intended to be driven, viz., forward. But two North Carolinians evidently want to be listed among the "heroes" or "record makers," for they have announced their intention of driving an automobile backwards from Winston-Salem to New York City, a distance of about 1,000 miles. They are J. H. Lehman and J. H. Nixon, who claim to have been offered \$2,000 for the feat. As is usual with such stunts, they agree to forfeit \$2,000 if they fail. No time limit has been put on the test, although the men announce their intention of making the trip in 15 days. The date for the start has not yet been fixed.

London's Taxicab Theatre Party Service."

In an endeavor to create a greater demand for its electric taxicabs, the Electromobile Co., of London, has inaugurated what it styles "theatre party service." For the modest sum of 15 shillings (\$3.75) the company agrees to take four persons to dinner, to the theatre afterward, to supper after the theatre, and finally home.

WHEN MOTOR CAR IS MOTORCYCLE

Astounding Conclusions Reached by British Racing Authorities—Hair-Splitting That Smacks of the Ludicrous.

After a conference between representatives of the Royal Automobile Club and the Auto-Cycle Union, British racing authorities have to their own satisfaction decided a weighty question and drawn a very fine hair line between the motorcycle and the motor car, and defined the difference between tweedledum and tweedledee, so to speak. The necessity for the conference was provoked by the appearance of a num-

"Cyclecars" which exceed these measurements will be classed with motor cars and will compete under the rules of the R. A. C.

New Clubs and Club Elections.

The Stephenson County Motor Club has been organized in Freeport (Ill.) with the following officers: President, Harry C. Boeck; vice-president, W. N. Tice; secretary, Seth Scott; treasurer, Dr. F. N. Pellett.

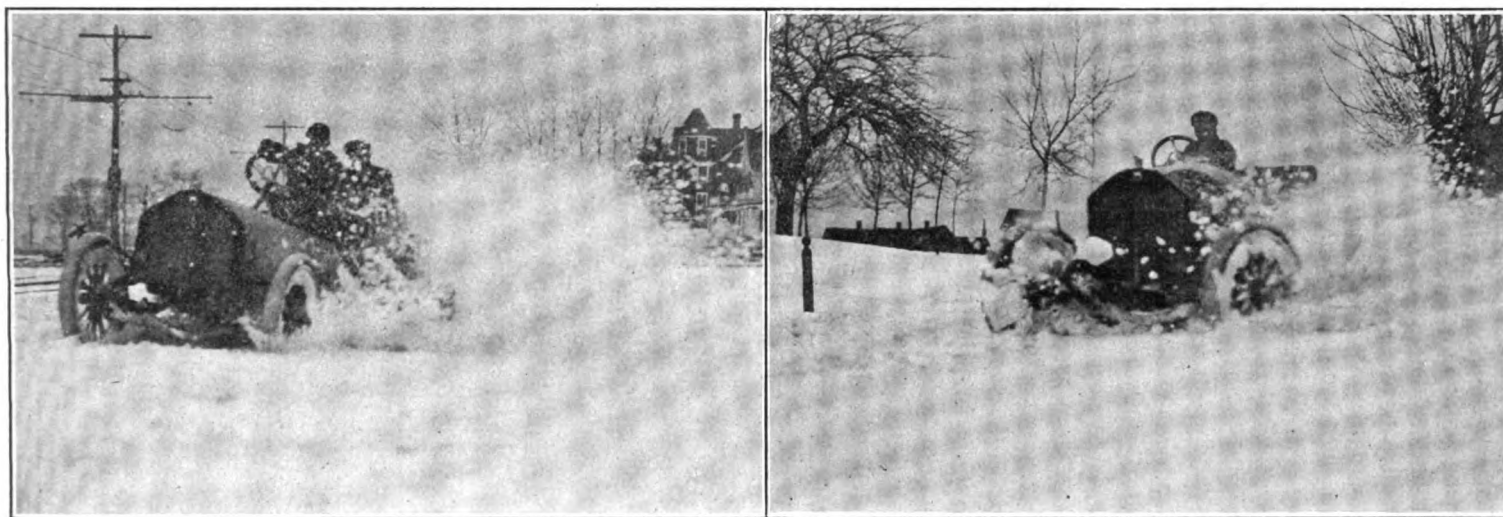
The Waseca (Minn.) Automobile Club has been organized and the following officers elected for the first year: President, C. H. Watson; vice-president, Dr. J. F. Flynn; secretary and treasurer, Dr. A. J. Rudolph.

The Savannah (Ga.) Automobile Club

WHEN HIGHER POWER IS BLAMELESS

Germany's Supreme Court Renders Decision in a Remarkable Accident Case—Confirms Verdict for Motorist.

The Reichsgericht, the supreme court of the German Empire, having recently declared that when circumstances over which the operator of a motor car has no control enter into the make-up of a collision or accident, the famous "Higher Power clause" may be invoked, and the operator held blameless, in an endeavor to obtain a further extension of this clause the Heilbronn Electric Railway Co. last month ap-



BUCKING MICHIGAN SNOW DRIFTS IN A HAVERS "6-44"—ONLY METHOD OF TRANSPORTATION AVAILABLE AT THE TIME

ber of hybrid vehicles which, in the opinion of the authorities, are neither one nor the other. In general, they are light, four-wheeled automobiles, in the true sense of the words, equipped with motors ranging from 3 to 10 horsepower, and arranged to seat one or two passengers. The one-seated vehicles heretofore have been styled "monocars" and those which carry two passengers, usually tandem, have gone under the appropriate name of "duocar."

Though the vehicles obviously cannot be classed as other than light automobiles, neither the R. A. C. nor the A. C. U. would consent to take them under their wings, and as a result there was no place for them in contests despite their rapidly increasing popularity. Hereafter, however, they will be lumped in a common class and styled "cyclecars," and herein becomes apparent the exceedingly fine line which has been adopted as distinguishing a motor car from a motorcycle. It is decreed that in order to compete with motorcycles, and, in fact, to become one, a "cyclecar" shall be limited in weight to 600 pounds (including tires), and in cylinder capacity to 1,100 cubic centimeters (67.1 cubic inches).

has re-elected the following officers: President, Harvey Granger; secretary and treasurer, A. W. Solomon. The board of directors includes Mayor George W. Tiedeman, F. C. Battey and the other officials.

J. C. Thompson was chosen president of the Oshkosh (Wis.) Automobile Club at its annual meeting last week. The other officers elected are: Vice-president, L. Frank Gates; secretary, I. S. MacNicol; treasurer, Louis Schreiber.

At the annual meeting of the Omaha (Neb.) Motor Club, held on Friday last, 15th inst., the following officers were elected: President, C. L. Gould; first vice-president, William A. Redick; second vice-president, Harry Lawrie; third vice-president, Henry N. Peters; secretary, W. J. Kirkland; treasurer, E. R. Wilson.

Hungarian International Non-Stop Run.

An international reliability tour for light cars has been organized by the Hungarian Automobile Club, to be held June 6th to 9th, next. The rules provide for a non-stop run, restricted to vehicles having four or six-cylinder engines of a capacity of not more than 2.33 liters (138.6 cu. in.).

pealed to the court from a judgment condemning the railway company to pay heavy damages to a passenger in an automobile who was hurt by flying splinters and blinded in one eye. The Reichsgericht, however, affirmed the judgment.

The accident, which probably stands unique in the annals of motoring, occurred in Heilbronn, and was caused by the placing of a toy-bomb on the rails of the street railroad. At the instant that one of the trolley cars touched the bomb and exploded it, an automobile was passing and one of the passengers was struck by a flying splinter of the bomb and seriously injured in the eye, the injury causing the subsequent loss of his eyesight. It was claimed at the trial that mischievous children had placed the bomb on the rails; that, the trolley cars being confined to a permanent track which they could not leave voluntarily, the accident was unavoidable, and that according to the German accident laws it must be placed in the category of "accidents caused by a Higher Power"—for which accidents no human being can be held responsible.

Despite the fact that the best legal talent

was engaged to fight the case for the railroad company, the lower courts found in favor of the plaintiff, holding the railroad responsible for the conditions of the rails and for the presence of foreign objects thereon. The appeal to the higher courts was fought with great bitterness, as the principle involved was one which threatened to establish a precedent which would be of the highest importance to all urban traffic. A number of oculists and other physicians testified that similar accidents

caused by exploding toy-bombs on the rails had come to their knowledge, and the court therefore held that it was an accident of the sort which could not be considered so unexpected as the railroad company would have the court believe; that children had done this before and would do so hereafter and that the proper thing for the company to do would have been to stop them.

The most astonishing argument, however, came up during the cross-examination by the State's attorney. It was then

brought out that if the car had been an automobile and capable of choosing its own path, the accident must be considered as a case of "Higher Power beyond human control"—it being manifestly impossible for a chauffeur to notice such a small object as a toy-bomb in the street and to take precautions accordingly. But the fact that explosives had been known to have been placed on street car tracks before the accident in dispute occurred made the matter a case of negligence on the part of the railroad.



INDEX TO ADVERTISERS



A	
Abbott Motor Co.....	1219
Adamson Mfg. Co.....	1220
Ajax-Grieb Rubber Co.....	1204
American Ball Bearing Co.....	1156
American Motors Co.....	1219
American Starter & Carburetor Mfg. Co.	1213
Anderson Electric Car Co.....	1158
Anderson Spark Plug Co.....	1202
Apple Electric Co.....	1200
Argo Electric Vehicle Co.....	1219
Atwater Kent Mfg. Wks.....	1157
Auburn Specialties Co.....	1200
Automobile Supply Mfg. Co.....	1216

B	
Badger Brass Mfg. Co.....	1214
Barthel, Daly & Miller.....	1220
Bartholomew Co.	1209
Benz Auto Import Co.....	Inside F. C.
Bosch Magneto Co.....	1211
Bossert Co.	1214
Bower Roller Bearing Co.....	1214
Bretz, J. S., Co.....	1220
Briggs-Detroit Co.	1218
Brown Co.	1216
Brown-Lipe Gear Chapin Co.....	1215
Bush Mfg. Co.....	1201

C	
Cartercar Co.	1217
Century Electric Car Co.....	1214
Champion Ignition Co.....	1210
Champion Spark Plug Co.....	1214
Clark-Carter Automobile Co.....	1216
Classified Advertising	1199-1200
Colonial Electric Car Co.....	1218
Consolidated Mfg. Co.....	1208
Continental Motor Mfg. Co.....	1201
Covert Motor Vehicle Co.....	1202
Cramp, Wm. & Sons, Ship & Engine Building Co.	1213

D	
Dayton Rubber Mfg. Co.....	1200
Dean Electric Co.....	1152
Diamond Chain & Mfg. Co.....	1215
Diamond Rubber Co.....	1209

E	
Electric Welding Products Co.....	1205
Empire Tire Co.....	1216

F	
Faries Mfg. Co.....	1220
Federal Rubber Mfg. Co.....	1153
Fedders Mfg. Works.....	1215
F. I. A. T.....	1218
Firestone Tire & Rubber Co.....	1216
Fisk Rubber Co.....	1154
Ford Motor Co.....	1150

G	
Gray & Davis.....	F. C.
Goodyear Tire & Rubber Co., The....	1200
Grossman, Emil, Co.....	1200

H	
Hartford Auto Parts Co.....	1210
Hartford Suspension Co.....	1200
Havers Motor Car Co.....	1212
Haynes Automobile Co.....	1217
Henderson Motor Sales Co.....	1204
Hupp Motor Car Co.....	1219
Hyatt Roller Bearing Co.....	1215

I	
Inner Shoe Tire Co.....	1200
International Accessories Corp.....	1207
Inter-State Automobile Co.....	1217
Invincible Starter Co.....	1214

J	
Jamestown Wheel & Mfg. Co.....	1201
Jeffery-DeWitt Co.....	1216
Jeffery, Thomas B., Co.....	1166
Jones Speedometer	1212

K	
Kellom, Chas. F., & Co.....	1202
Kelly-Springfield Tire Co.....	1200
King Motor Car Co.....	1212
Kinsey Mfg. Co.....	1206
Kinsler-Bennett Co.....	1220
Kissel Motor Car Co.....	1161
Kline Motor Car Corp.....	1220
Knox Automobile Co.....	1217

L	
Lauth-Juergens Motor Car Co.....	1207
Leather Tire Goods Co.....	1200
Locomobile Company	1200
Lovell-McConnell Mfg. Co.....	Inside B. C.

M	
McGraw Tire & Rubber Co.....	1201
McIntyre, W. H., Co.....	1218
Mais Motor Truck Co.....	1212
Manufacturers and Dealers Motor Fire Insurance Co.....	1149
M. and P. Electric Vehicle Co.....	1165
Marion Sales Co.....	1219
Mayo Radiator Co.....	1151
Metz Co.....	1217
Michelin Tire Co.....	1213
Michigan Buggy Co.....	1219
Miller, Chas. E.....	1151
Moline Auto Co.....	1204
Mosler, A. R., & Co.....	1201
Moss Photo Engraving Co.....	1208
Motor Car Equipment Co.....	1201
Motor Truck Body Co.....	1212
Mott Wheel Works.....	1220
Motz Tire & Rubber Co.....	1201

N	
National Motor Vehicle Co.....	1217
New Departure Mfg. Co.....	1160
New Process Rawhide Co.....	1213
New Tyr Mfg. Co.....	1211
Nordyke & Marmon Co.....	1219
Not-A-Crank Gas Engine Starter Co.....	1214

O	
Oakland Motor Car Co.....	1218
Owen, R. M., & Co.....	1200

P	
Packard Electric Co.....	1213
Parish Mfg. Co.....	1201
Penn Spring Works.....	1200
Perfection Spring Co.....	1200
Petrel Motor Car Co.....	1217
Pittsfield Spark Coil Co.....	1206
Pullman Motor Car Co.....	1212

Q	
Queen Mfg. Co.....	1212
Quimby, J. M., & Co.....	1202

R	
Rajah Auto Supply Co.....	1215
R. C. H. Corp.....	1202
Reeves Sexto-Octo Co.....	1202
Reflex Inspection Light Sales Co.....	1203
Remy Electric Co.....	1162-63
Royal Equipment Co.....	1204

S	
Sackman Mfg. Co.....	1215
Safety Tire Gauge Co.....	1200
Salisbury Wheel & Mfg. Co.....	1215
Schrader's Son, A., Inc.....	1210
Selden Motor Vehicle Co.....	1219
Shawmut Tire Co.....	1218
Smith, A. O., & Co.....	1215
Sparks-Withington Co.....	1208
Speedwell Motor Car Co.....	1217
Splitdorf, C. F.....	1216
Springfield Metal Body Co.....	1200
Standard Roller Bearing Co.....	1202
Standard Oil Co.....	1211
Standard Tire Protector Co.....	1259
Stearns, F. B., Co.....	1155
Stewart & Clark Mfg. Co.....	1164
Sturdy Mfg. Co.....	1204

T	
Thomas, E. R., Motor Car Co.....	1200
Timken Roller Bearing Co.....	1167

U	
United Rim Co.....	1213
U. S. Auto Horn Co.....	1214
United States Tire Co.....	1201

V	
Velie Motor Vehicle Co.....	1218

W	
Warner Gear Co.....	1213
Warner Instrument Co.....	1211
Weed Chain Tire Grip Co.....	1201
Western Motor Co.....	1213
Whitney Mfg. Co.....	1205
Willard Storage Battery Co.....	1201
Willys-Garford Sales Co.....	B. C.
Willys-Overland Co., The.....	1168
Winton Motor Car Co.....	1218

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A \$2000 car, on which the insurance premium is \$240, in
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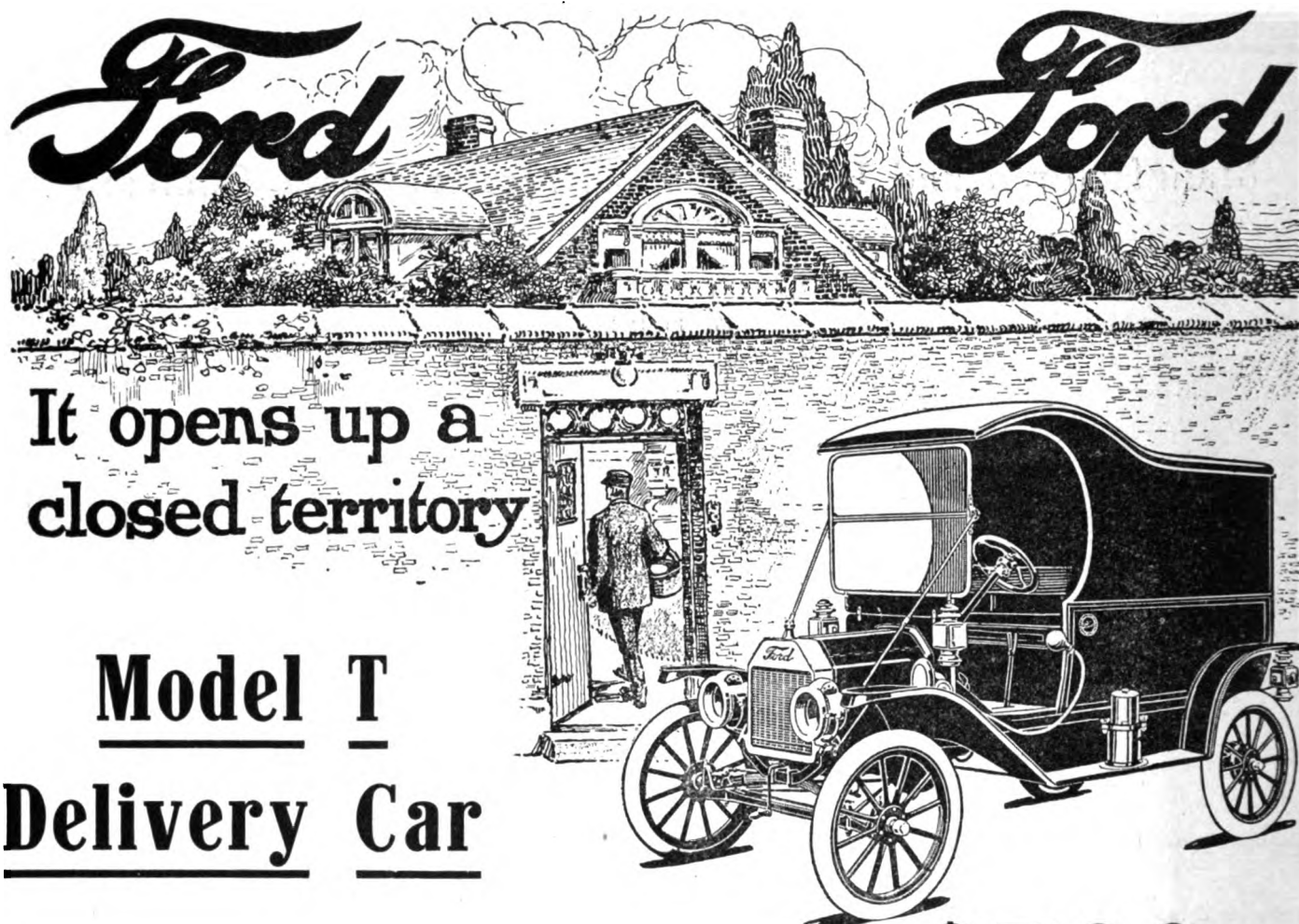
WRITE US and we will give you some information which you
should have.

Yours very truly,

ORGANIZATION COMMITTEE,

By Ernest H. Greenwood, Secretary.

P. S. Look for letter number 3 on this page next week.



It opens up a
closed territory

Model T Delivery Car

The Barriers Are Down for all the many lines of business that have been looking for a light, flexible, tough, low-priced, high-quality delivery car. Not a truck nor a van, but a CAR—that can cover the ground, open up new territory, bring in new customers, advertise its owner, extend the business, outwork a team of horses and cut the maintenance bill. **That car is this FORD Model T Delivery.**

THERE IS NO CLOSED TERRITORY to the wholesaler, the retailer, the power or light company that uses the Ford Model T Delivery Car. It eats up space and annihilates time. It makes relics of more than a million old style delivery vehicles in the United States. It is the feature of 1912 in commercial automobiles. It advertises its dealers and booms its buyers.

TWO YEARS OF HARD PRACTICAL TEST lie behind this statement of fact. The Wanamaker stores of New York and Philadelphia, and the Bell Telephone Company all over the Country, have taken these Ford Model T Delivery Cars and driven them now for over two years, winter and summer, uphill and down. No factory test here, but the actual grind of work. Result—not a change. The **guarantee of Accomplishment** stands on this car.

Light: weighs 1200 pounds—low tire expense—less fuel, multiplies the actual horsepower—carries 750 pounds of merchandise—carries it anywhere, any time.

Flexible: turns in a circle of 28 feet—accommodates itself to owner's and customers' space.

Tough: the same strong chassis of all Ford Model T cars—same simplicity of operation, same Ford magneto built into the motor, same Vanadium steel throughout (40 locomotives of vanadium at twice the cost of carbon steel are now being considered by the Secretary of War for use at Panama).

Low-priced: completely equipped—\$700—no more than a team and wagon.

High-quality: stands side by side with the other productions of Ford genius—with more than 100,000 drivers vouching for them.

Your competition is active. Think hardest and FIRST. Send for our descriptive booklet. Ford branches and dealers everywhere.

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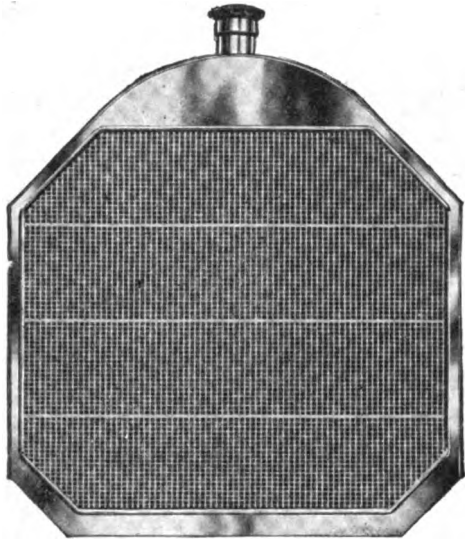
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This price includes full equipment—Automatic Brass Windshield, Speedometer, Ford Magneto built into the motor, two six-inch Gas Lamps and Generator, three Oil Lamps, Horn and Tools. No Ford cars sold unequipped.

Capacity, 750 pounds of Merchandise.

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Detroit, Michigan, U. S. A.



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¶ Good reason why they should be—every detail that goes to make up a thoroughly efficient automobile radiator will be found in MAYO Radiators.

¶ The highest class cars embody them.

¶ MAYO Quality—the Highest Quality.

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WHAT IT DOES:

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WHEN the bulb horn is used as a regular service signal, its acknowledged inadequate warning note requires a second signal—the one-tone loud electric horn.

¶ This combination of signals on the modern motor car is simply an open acknowledgement of the inefficiency of such a crude arrangement. It has been proven conclusively that an abrupt signal note cannot be obtained from the bulb horn, and furthermore that the most expert juggling fails to produce a low abrupt note of effective duration from the single-tone-loud emergency horn, thus the latter must supplement the former for loud signal purposes only and the confusion and time required to go from the bulb to the button completely defeats the purpose for which the loud warning signal was devised, that of obtaining instant attention when the regular service signal fails.

¶ The TUTO Horn does all of the signalling on the motor car in a simple and most efficient manner, as its one horn, one push button and one connecting cord are so designed with an ordinary pressure of the controlling button, a low and abrupt note of any duration will be produced and that a full pressure on the same button instantly produces the loud warning signal. The going from one signal to the other does not require the movement of a hand or foot, simply the increase of pressure on the operating button which is located on the steering wheel and right under the thumb.

¶ The low TUTO note will get the right-of-way in the most courteous manner 90 per cent of the time, whether in the city or country, while the loud signal is sufficiently powerful for all emergency purposes and country driving, yet not paralyzing in effect.

¶ The completeness of the TUTO fixtures and mountings make a neat and permanent job of installing the horn on any type of car. There is nothing better for standard equipment and discriminating car manufacturers are quick to select the TUTO as the logical and best warning device.

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"Look for Dean where Quality's seen."

FEDERAL TIRES

The Tires of "Extra Service"

Federal Tires represent the crystallized effort of experienced tire makers—each contributing their best efforts from the time the crude rubber first enters the plant until the finished tires are ready for shipment. In many years of tire making experience these men have learned the best methods and means to produce *quality* tires.

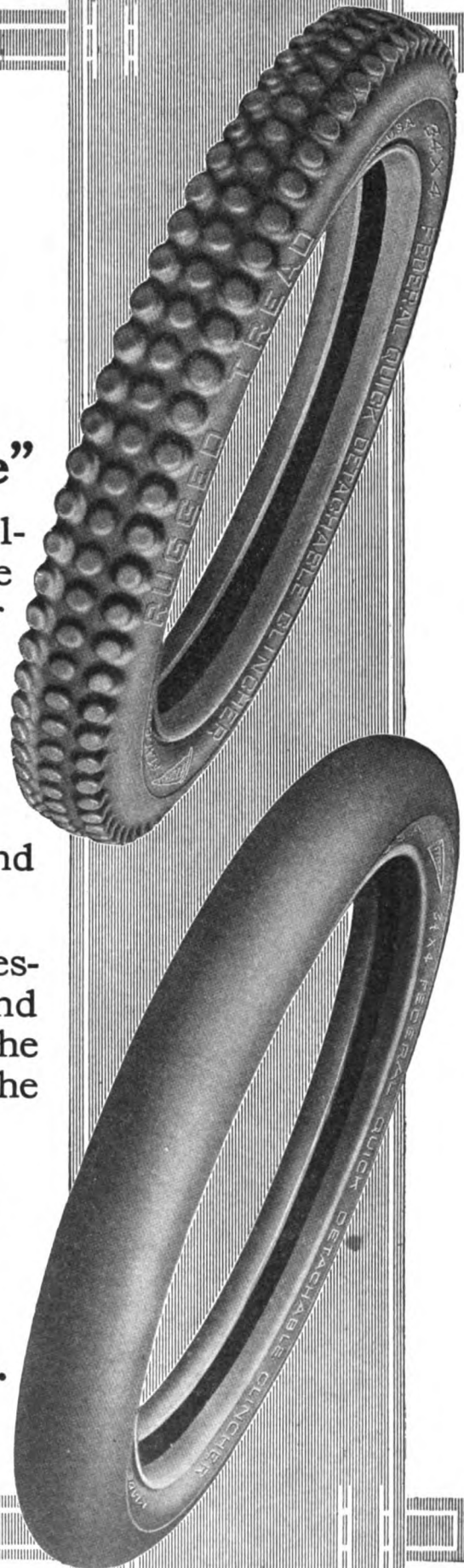
Federal Tires contain all the necessary elements of quality, skill and experience, which accounts for the fact that they are known as the tires of "Extra Service."

The Federal Rugged Tread and the Federal Wrapped Tread Tires are made to fit all standard rims and are procurable through leading dealers and auto supply houses.

An interesting tire book mailed on request

Federal Rubber Manufacturing Co.
Milwaukee

Branches and Agencies: *New York, Chicago, Boston, Kansas City, Denver, Atlanta, Los Angeles, Pasadena, San Diego, Portland, Louisville, Indianapolis.*



Fisk

Investigate and You Will Buy Fisk Tires For Service

They are made in one quality and of one construction—**The Fisk Heavy Car Type.**

Our success in building uniformly strong tires accounts for their consistently high average mileage. It is a balanced construction which we believe is to-day unique in tire manufacture.

Inquire among Fisk Tire users in Boston, Chicago or San Francisco—in any city from Maine to Texas—and you will receive a unanimous verdict in favor of *Fisk Mileage and Fisk Factory Service.*

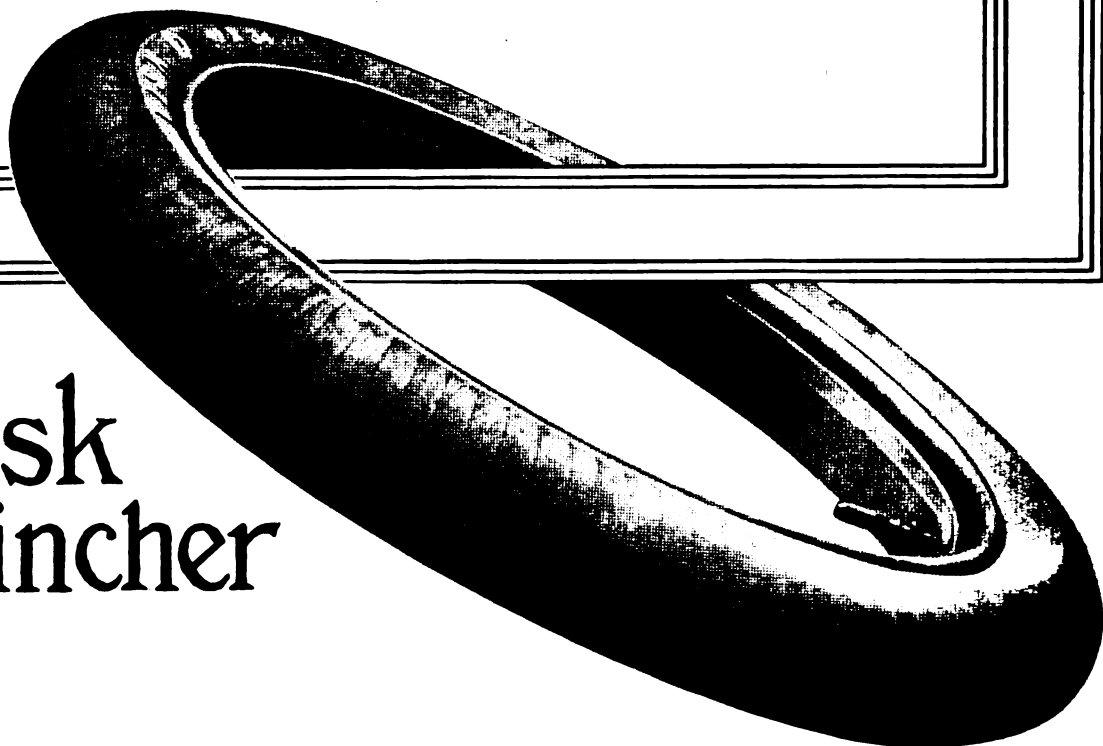
THE FISK RUBBER COMPANY

Department 23

Direct Factory Branches in 35 Cities

Chicopee Falls, Mass.

Fisk
Clincher



The Stearns-Knight Car

The Czar of Russia Owns a Knight-Motored Car

So does the Emperor of Germany.
So do the Kings of England, Belgium, Spain.

So do more than 8,000 men on both sides of the Atlantic, who demand the best the world can offer in their pleasure cars.

In Europe, the list of Knight owners is the Blue Book of Motordom.

Daimler—the leading car of England—since 1908 has been a Knight-motored car.

Mercedes—the monarch of the German field—is now a Knight-type car.

And the Mercedes engine, which the Knight-type supplanted, was considered the master engine of the world.

Panhard, the pride of France—Minerva, Belgium's greatest car—both have come to this sleeve-valve motor.

Thus the four leading cars of the Old World have recognized that the poppet valve must go.

Last summer, after two years of testing, the Stearns came into line.

That is the record of the Knight-type motor after three years of the limelight.

Five of the world's greatest makers adopt it. And 8,000 owners of high-grade cars have become Knight-type enthusiasts.

Consider these facts when somebody warns you that the Stearns-Knight is an experiment.

The World-Wide Effort To Get Rid of Poppet Valves

Every great designer who still employs poppet valves is seeking a way to get rid of them.

We adopted the Knight way because we regard it the ideal solution. And the foremost engineers have agreed with us.

But those who belittle it—to sell cars without it—are seeking other means to this end.

For poppet valves form the greatest shortcoming in modern gasoline engines. They are noisy and slow and leaky.

There are two in each cylinder springing shut hundreds of times per minute.

They require frequent grinding. When carbon accumulates, so the

valves aren't tight, there is vast waste of power.

Cams are required, and cams get noisy when they wear. Timing gears are used, and their humming can be heard.

Thus silence is made impossible. Power and efficiency are greatly reduced. And every designer knows it.

The Stearns-Knight engine has no timing gears, no springs, no cams, no poppet valves.

There is no carbon trouble, no valve grinding, no leakage. The action is silent and certain.

No man who knows half what we know about it will consider a poppet valve motor.

The Silent Power

The silence of the Stearns-Knight is almost uncanny.

When turning idly at the curb there is scarcely sound or vibration to show the engine is running.

"The car glides on the road," says one of the owners, "as though it were sliding on runners."

Equipment

Warner Auto-Meter.
Banker Windshield, Model K.
Silk Mohair Top and Cover.
Vesta Dynamo Electric Lighting System.
Continental Q. D. Demountable Rims (two extra rims).
Klaxon Horn—also Bulb Horn.
Trunk Rack, Robe Rail, Foot Rest, etc.

Touring Car
Toy Tonneau
Roadster

\$3,500

Every evidence of effort to which one is accustomed is lacking in the Stearns.

On hills the Stearns-Knight shows that persistent power known in electric motors.

In traffic one may run at walking speed on high gear, then quickly accelerate to any speed wanted without any jumping or pounding.

The four-cylinder Knight-type offers all the flexibility of the six-cylinder poppet valve.

We Were Swamped By the Calls for This Motor

We have built Stearns cars for 16 years. They have attained an immense popularity.

But the first announcement of this sleeve-valve motor doubled our sales in a month.

It compelled us to lease a new factory.

Hundreds of men who got early deliveries have run these cars thousands of miles. And the letters we get from them form the highest tribute ever paid an American car.

Adds 50 Per Cent. To the Engine's Rated Power

The cylinders in the Stearns-Knight are $4\frac{1}{4} \times 5\frac{1}{2}$ inches.

By accepted standards such an engine is rated at 28.9 horsepower.

But we guarantee that this engine will show an excess of not less than 50 per cent.

This is due to the absence of poppet

valves, and their leakage. And to the spherical shape of the explosion chamber.

That's an immense item.

No larger cylinders, no greater consumption of gasoline. Yet half again as much power as the rating calls for. Think what that means.

Won Dewar Trophy In the Greatest Test on Record

The Royal Automobile Club of England offers the Dewar Trophy.

It is offered for the greatest achievement of the year in automobile engineering.

In 1909 this trophy was won by the Knight-type motor.

It was won in a test beyond precedent—a test which engineers called im-

possible—a test which no poppet valve motor ever will attempt.

At the end of the test—which equalled two years of ordinary service—the engines developed more power than they did at the start. And they showed not a sign of wear.

Such is the verdict of the world's foremost authority on the sleeve-valve type of motor found in the Stearns-Knight.

No Leading Car Can Lead for Long Without It

The Knight-type motor, after years of tests, has been adopted by the world's best cars.

Each, to adopt it, displaced a poppet-valve engine as good as men can make.

What is done by Daimler, Mercedes, Panhard and Minerva—in so vital a

matter—must be done by all great cars soon or late.

The leading cars of the future will be Knight-type cars. The evidence is overwhelming.

No lesser features can ever outweigh this silence, this power, this efficiency.

Send for Our Books

Every motor car lover should know the facts about this Stearns-Knight motor.

It is the topic of the hour in motor-dom.

We have interesting booklets, and you are welcome to all of them. Send

us this coupon and we will mail them to you. Send it today.

Coupon

THE F. B. STEARNS CO. (19)
Cleveland, Ohio

Mail me all of your pamphlets about the Stearns-Knight.

Name

Address

THE F. B. STEARNS COMPANY

Cleveland
Sixth City

Dealers and Branches in
125 Principal Cities

American

American Axles

Can Now Be Furnished
With the Famous Lanchester Worm Gear
as Well as With Bevel Gears.



We have secured from the Warner Gear Company, of Muncie, Indiana, the sole American rights, as axle manufacturers, to the use of the Lanchester Worm and Gear in our product.

Car owners—present and prospective—will therefore find this announcement the most important automobile news of the year.

The successful use in England of the Lanchester Worm Drive for the past few seasons has aroused the keenest interest on this side of the Atlantic.

Its service abroad has been so satisfactory, and it is admittedly so superior in every way to other worm types, that we take especial pleasure in adding it to the *American* line of axle equipments.

We are now prepared to supply axles with the Lanchester drive for use on all types of gasoline or electric pleasure cars and commercial vehicles.

The Lanchester is peculiarly adapted to electrics, because it allows high motor speed with a single, direct reduction to the axles.

In cars of all types the Lanchester is noiseless; not merely "practically so," but absolutely. Prolonged use has virtually no effect in rendering this drive noisy.

Lanchester gears have traveled 120,000 miles in England with little or no apparent wear. Mileage running 60,000 to 80,000 is already common.

The high service and minimum wear of this form of surface contact is its own best evidence of the skill with which it has been designed.

You will also recognize our especial fitness to produce this new type of drive, by reason of our pioneer work in axle construction generally, and the commanding position we have rightfully earned in this industry.

We shall be glad to furnish more detailed information concerning the Lanchester Worm Gear in *American Axles* upon direct application.

THE AMERICAN BALL-BEARING CO.

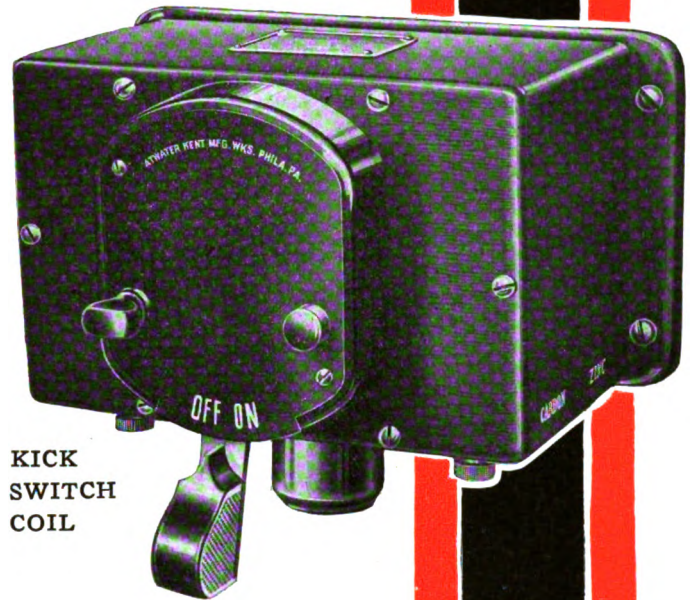
L. S. & M. S. Ry. and Edgewater Park

CLEVELAND, OHIO

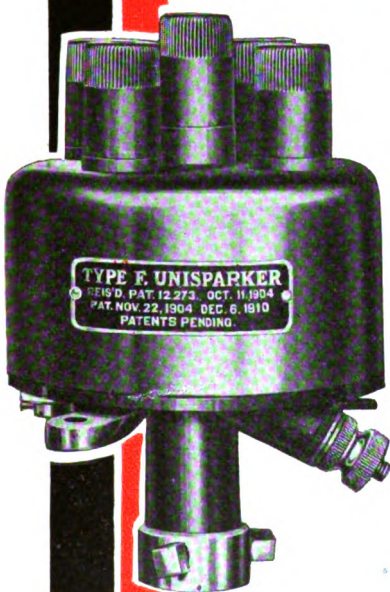
American

The Atwater Kent Ignition System

BETWEEN now and Spring thousands of Atwater Kent Systems will be installed on new and old cars of nearly every make and model. Every dealer, garage and repair man should keep in touch with us especially during this overhauling season. Many cars need only a reliable and efficient ignition system to make them run better than new—and **NOW** is the proper time to make the change.



KICK
SWITCH
COIL



The Atwater Kent System combines the good features of both magneto and battery systems without the weaknesses of either. It is easily installed and easily maintained. There is practically no wear, and the single adjustment seldom requires attention. In the entire system there are but three moving parts and one contact—no commutator, relay or vibrating coils are used. No more simple or efficient ignition device is known.

Write at once for our booklet "D" with interesting details and full description.

Atwater Kent Mfg. Works

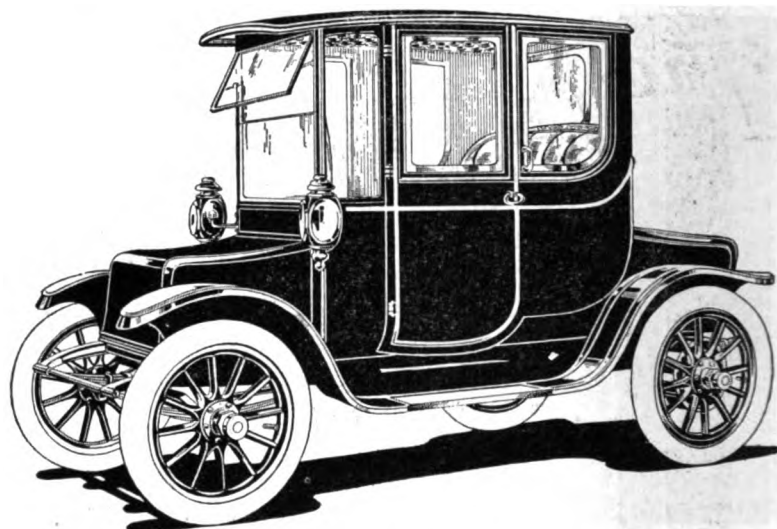
46 N. Sixth St., Philadelphia, Pa., U. S. A.

NEW YORK.....E. J. Edmond Co.
BOSTON.....F. R. Parker Spec. Co.
CHICAGO.....Motor Car Supply Co.
SAN FRANCISCO, Chanslor & Lyon M.
S. Co., Weinstock-Nichols Co.

MILWAUKEE.....Julius Andrae & Sons
OMAHA.....Omaha Rubber Co.
CHATTANOOGA.....Sanford Brothers
DALLAS.....Fisk Co. of Texas

THE *Detroit* ELECTRIC

**Chainless
Shaft
Drive**



DEALERS should study the features which have made the Detroit Electric the recognized leader "in the trade" and the pride of owners in every city where only the best can satisfy. Not one but many features have contributed to its ascendancy.

For those not familiar with the latest development in electric automobiles we append a brief outline of the latest innovations as a guide to those who wish to be up-to-date on the electric car situation.

Horizontal Controller Lever—

Fitted into the side of the car itself, allowing full seat room. Parallel with steering lever. When not in use both levers can be raised upright, flat against the side of the car, entirely out of the way.

Brakes—

Four extra powerful brakes act on the rear wheels. More braking surface than on any other electric made, simple and easy to operate. There are two foot pedals, which may be used separately or together, as required. In case of emergency the brakes may be applied and locked by one pressure of the foot, at the same time automatically cutting off the power.

Aluminum Fenders "Closed-in"—

No open space between fenders and body. Protection from dirt and splash of the road. Adds to the appearance of the car. Fenders do not rattle; more substantial than leather, lighter than steel.

Illustrated catalog showing our nine beautiful models, sent on request.

Anderson Electric Car Co., 423 Clay Avenue, Detroit, U. S. A.

Buffalo
Brooklyn
Cleveland

Branches:
New York, Broadway at 80th Street
(Also Branch at Evanston, Ill.)
Chicago, 2416 Michigan Avenue

Selling representatives in most leading Cities

Kansas City
Minneapolis
St. Louis

Aluminum Body Panels—

Add to the strength of body, life of the car and beauty of finish. Do not check, warp or crack. Even the moldings are made of aluminum (not wood).

Low Hung Bodies—

All 1912 Detroit Electrics have low hung bodies, low center of gravity and the easiest riding springs made, whether you use Pneumatic or Motz Cushion Tires.

Divided Front Window—

Adjustable from one inch to full depth, without disturbing occupants. The top half swings out like a wind shield. Protection in storm, plenty of fresh air in summer.

Batteries—

We furnish Edison nickel and steel batteries, for which we have exclusive rights in pleasure cars, or Detroit Electric Guaranteed Lead Battery. There are 73 cars in Kansas City and vicinity equipped with the Edison Battery.

Motor—

Our own exclusive design, built and speeded expressly for an electric automobile; made in our own shops, of course. Hill climbing and heavy loads never overheat or burn out Detroit Electric motors. In Seattle, where hills and road conditions are extraordinary, 84 out of 104 electrics are Detroit Electrics.

"Chainless" Shaft Drive—

Only true Direct Shaft Drive on electric automobiles. Patented. The word "Chainless" is your protection against so-called "Shaft Drives" with concealed chain or gear reductions housed at the motor beneath the car to rattle, wear and waste power. There are no chains to stretch and slack anywhere on a Detroit Electric—a great advantage in hilly cities where strains are so severe.



Time: 3 A. M.
Scene: 20 Miles from Nowhere
Trouble: Everything
Lost: Sleep! \$80! One girl!
Monolog: G'r'r'r!!

Tire Misery Must Go! Get Protection Pleasure

GET rid of tire misery *now*. You can't afford to delay using these tire protectors. You can't afford it from either a money-losing or pleasure-losing standpoint. And now you never need endure another of those costly tire troubles, not even the least of them. They are all ended. For here is a tire protection that protects. Protects against puncture, blowout, stone cut or bruise, chafing, and all the other forms of wear and tear. Think of riding on one set of tires for more than two years' constant travel, over good roads and bad, without a single tire trouble. Thousands of motorists who have found that Standard Tire Protectors keep tires uninjured, sound and good as new long after the longest lifetime of unprotected tires, are getting the pleasures and making the savings that you can get and save with

Standard Tire Protectors

No freakish filler or leather tread! The toughest rubber ever produced—a new rubber—is used exclusively in Standard Tire Protectors for 1912. With layers of fabric that will stop nails, glass and all other tire dangers—this new and toughest rubber makes Standard Tire Protectors almost like armor plate around, over and outside your tire. All disappointing "retreading" unnecessary longer!

Lower Prices This Year

are the result of our new manufacturing facilities. On all the popular sizes, fully 20 per cent reduction from 1911 prices removes the least reason for you to hesitate. Standard Tire Protectors would be an economy at several times the prices you will pay for them. They

save you cost of missing trains, failing to meet business appointments on time, getting to the theatre when the play is half over,—they save you the costs of delay at all those times when delay means agony.

Skidding protection is combined with tire protection—the economy of double protection at just one single cost—by our famous non-skid tread, which may be had instead of plain tread if desired.

FREE Book on Tire Protection

You will find it full of valuable information and convincing proof that your tires need no longer be the bane of your motoring pleasures. Write for this free book today.



Ask
the
Man
Who
Uses
Them



The Standard Tire Protector Co.,
 330 E. Market St., Akron, Ohio

Dealers:—20 per cent average reduction to consumers and new scale of larger discounts to dealers, make Standard Tire Protectors one of your best-paying lines of auto accessories. You know that your last year's sales of Standard Tire Protectors would have been more than doubled had it not been for that troublesome price question. It is now solved. Our 1912 prices to consumers are far lower, dealer's discounts higher and the product far better than ever. The advance orders prove we shall sell five times as many Standard Tire Protectors in 1912 as we sold in 1911. You want to get your share of this increasing business. We are advertising nationally—reaching all motor car users. They will expect to get Standard Tire Protectors from you. Write us for new prices, terms and particulars of co-operation offered.

MAY WE HAVE YOUR LAYOUT Of Bearing Installation?

¶ We can save you money, time and trouble—in other words, show you a short cut to satisfactory bearing installation.

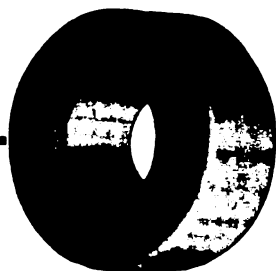
¶ The successful use of New Departures in 60% of the motor cars manufactured in this country proves that the quality of this American made bearing has been well established.

¶ This fact also constitutes a good reason why you should send us your layout and give our engineering and sales departments an opportunity to place our proposition squarely before you.

¶ Our engineering department is highly specialized, not only for the production of superior ball bearings, but for giving to the trade expert co-operative service.

The New Departure Mfg. Company

**BRISTOL,
CONN.**



**1016 Ford Bldg.
DETROIT, MICH.**

THE ROOMY

30 H. P.	\$1500
40 H. P.	1850
50 H. P.	2350
60 H. P. "Six"	3000

Prices include full equipment, except the "Thirty," which has more than regular equipment.
1½ to 2 ton, 3, 4, 5 ton Trucks, Delivery Wagons, etc.

KISSELKAR

KISSELKARS are generously roomy—more so than other cars. No one is cramped—the driver and his companion in the front seat have as much room as the passengers in the tonneau. This extra roominess is the basis of KisselKar comfort, added to by deep, springy upholstery, deep seats, extra liberal wheel base, extra big wheels and tires and springs of special resiliency. Road vibration is not a fatiguing element in the KisselKar.

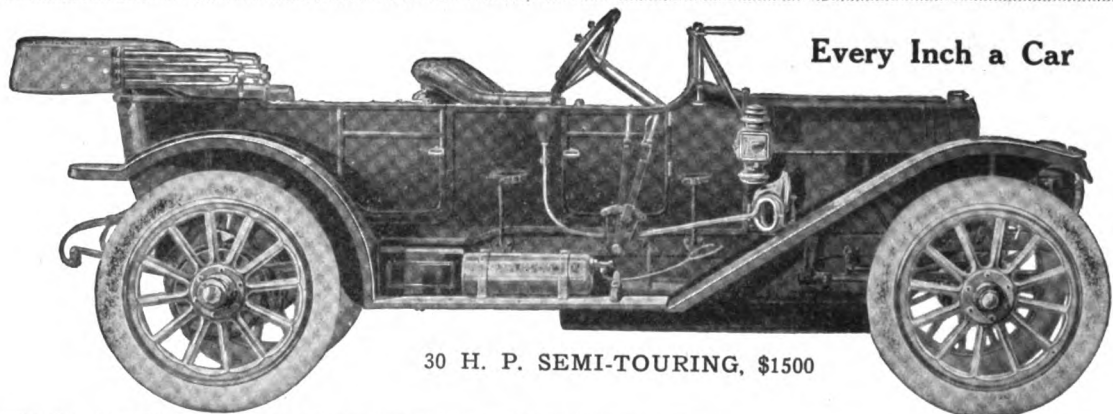
The ability, comfort, appearance and construction of the KisselKar are surpassed by no car at any price. You may not be able to investigate every automobile, but the special features and exceptional values of the KisselKar line deserve your special investigation.

Write for KisselKar Portfolio

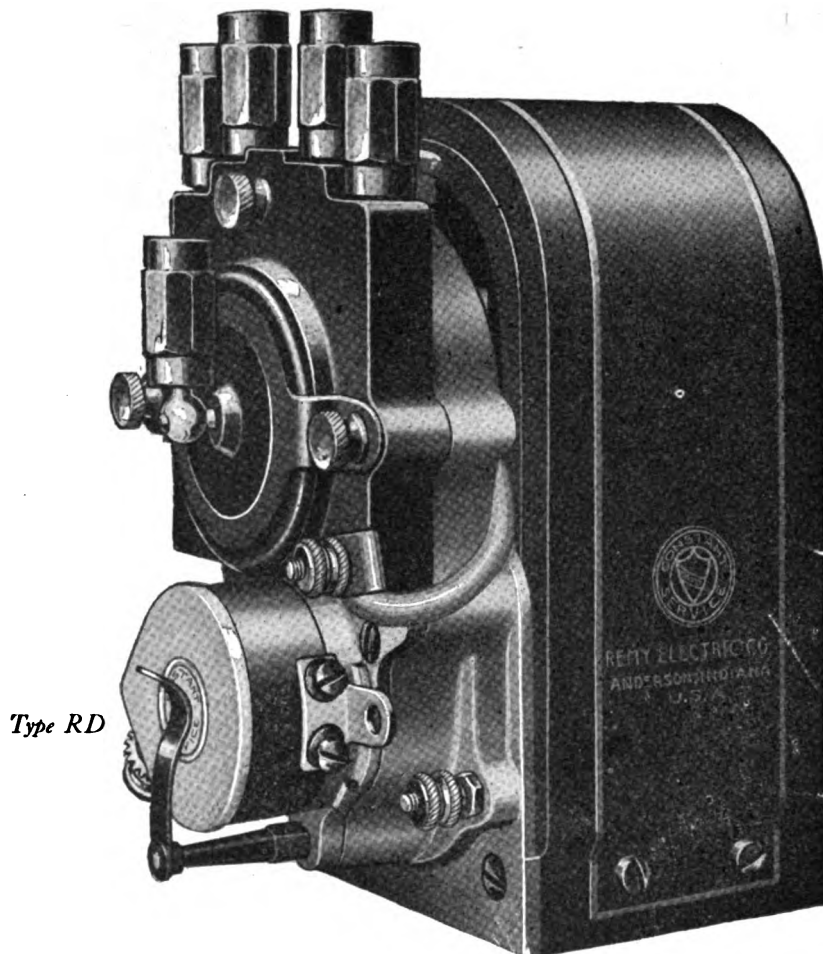
One of the most comprehensive automobile books ever published. Write for it, and the name of our representative in your territory. This book tells the story of how comfort and low maintenance are built into the KisselKar and pictures and describes the entire KisselKar line.

KISSEL MOTOR CAR CO. 159 Kissel Avenue Hartford, Wis.

Branches and distributors in Boston, New York, Baltimore, Philadelphia, Cleveland, Detroit, St. Louis, Dallas, El Paso, San Antonio, New Orleans, Chicago, Milwaukee, Kansas City, Omaha, Butte, Denver, San Francisco, Los Angeles, Seattle, Portland, Minneapolis, Duluth, Buffalo, Pittsburgh, Hartford, Conn.; New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg and other principal points throughout the United States.



REMY



Type RD

Announcement†

The REMY ELECTRIC COMPANY begs to announce to the Automobile Industry a new Magneto (Type RD) smaller in size, lighter in weight and fully fifty per cent more efficient electrically.

The new REMY is the last word in magneto construction; the highest development of the Inductor Type; the product of the best brains engaged in ignition designing and the most accurate workmanship that has been developed through years of practice in the greatest magneto factory of the world.

TO AUTOMOBILE ENGINEERS—Please ask us for data and full information. We are anxious that you should understand our product thoroughly.



Remy Electric Company

Factories—ANDERSON, INDIANA—Gen'l Offices

BRANCHES

NEW YORK

BOSTON

DETROIT

CHICAGO

KANSAS CITY

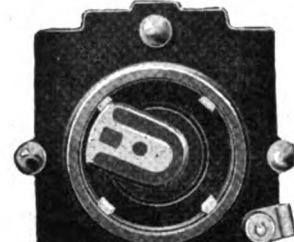
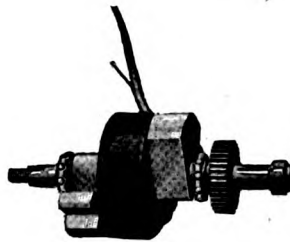
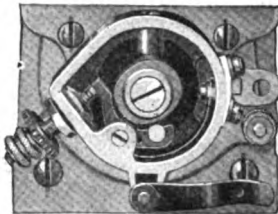
SAN FRANCISCO

INDIANAPOLIS





REMY



ALL THERE IS TO IT

The Inductor Type

You can certainly understand the tremendous advantage of the Inductor Type, the key to the great success of the REMY magneto. The whole effort of automobile engineering has been toward greater simplicity and greater efficiency. Here is a magneto without moving wires of any kind, without the troublesome wiping contacts, without delicate springs to weaken or break, without brushes to wear and get out of touch, without collector rings, without any of the intricate or frail devices that have made the magneto the one thing about your car you did not understand. Instead of miles of wound wire revolving in limited space, causing all kinds of trouble to insulate, you have two laminated steel inductors revolving outside a stationary winding, generating the primary current which is carried direct by a wire from the winding.

For Trucks and Tractors

Because it is so simple, because there is nothing frail or delicate about it, you can readily see the adaptability of the new REMY for service on trucks and tractors where solid tires are essential. For this work the REMY heavy duty magneto (TYPE RF) is especially designed—a heavier machine with three magnets—giving an exceptionally strong and certain current at slow speed under heavy loads.

Remy Service

The country-wide Remy Service is of immeasurable value to the manufacturer and his customer. A station right in his own city where all ignition difficulties can be looked after by trained experts.

REMY SERVICE STATIONS

Albuquerque	Memphis
Augusta	Minneapolis
Birmingham	Nashville
Baltimore	New Orleans
Boston	New York
Charlotte	Omaha
Chicago	Philadelphia
Cincinnati	Pittsburg
Cleveland	Portland, Me.
Dallas	Portland, Ore.
Denver	Rochester
Detroit	San Antonio
El Paso	San Francisco
Houston	St. Louis
Indianapolis	Seattle
Jacksonville	Spokane
Kansas City	Syracuse
Los Angeles	Utica
Louisville	Washington, D. C.

IN CANADA ADDRESS

Russell Motor Car Company at Montreal, Toronto, Winnipeg, Hamilton, Calgary, Vancouver, and Melbourne, Australia. Others Being Established



Remy Electric Company

Factories—ANDERSON, INDIANA—Gen'l Offices

BRANCHES

NEW YORK

BOSTON

DETROIT

CHICAGO

KANSAS CITY

SAN FRANCISCO

INDIANAPOLIS





When pins were made in jewelry shops only the very rich could afford them

"Pin money" ate a big chunk out of the purse of *every* woman. The hand-crafted article was not only more *costly*, but vastly *inferior* to its more *efficient* successor.

The price of *pins*—just as the price of *everything else*—is based upon the *cost of production*, and that, in turn, is ruled by *quantity*, because *without* tremendous demand *no* manufacturer could maintain the *expensive* and complicated automatic devices that have not only made pins *better*, but have also brought them within the *reach of everyone*.

The very reason that makes the *Stewart Speedometer* the *cheapest* also makes it the *best*.

It's *another* tale of a great *initial* investment in *special* mechanical devices through which we can make speedometers in so much *less time*, and in so *fewer* operations, that we can *undersell* and *outsell* the *universe*.

There's a *quality* reason back of the Stewart *popularity*; there's a *quantity* reason back of the *price*. Carried on *four* cars out of *five*.

Magnetic principle; jewel bearings; wearing parts hardened and polished; open dial; large figures, easily read; absolutely accurate; 100,000-mile season odometer; 100-mile trip register, can be reset to any tenth of a mile. Guaranteed for five years. Strongest flexible shaft; drop forged swivel joint; noiseless gears.

"ALWAYS ON THE JOB"

STEWART & CLARK MANUFACTURING CO.

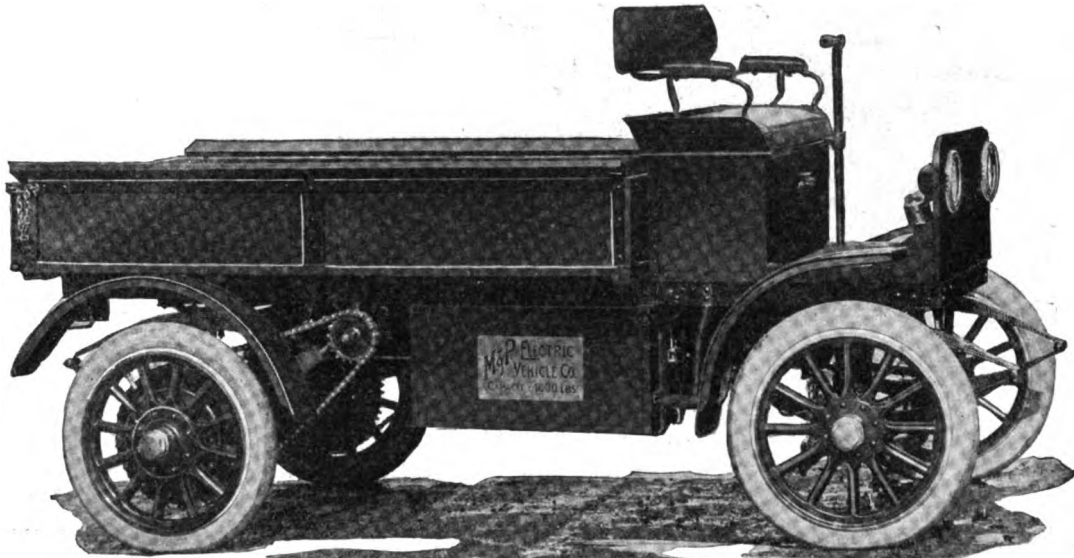
1928 Diversey Boulevard, Chicago, U. S. A.

Detroit San Francisco New York Los Angeles Chicago Boston London
Cleveland Philadelphia Minneapolis Indianapolis Kansas City Paris



Speedometers, \$15 to \$30
Clock Combinations, \$45 to \$70

The first Electric Truck at a Popular Price—"Standard in every detail"



Bare Chassis, including Driver's Seat, \$1450; Express Body, \$1500; Panel Body, \$1600.



1000 lb. Capacity Electric Truck

ACCESSIBLE
DURABLE
ECONOMICAL

Strictly a **Commercial Vehicle**—built and designed by men who know commercial services, sizes and requirements. Ample overload capacity—chain drive from jack-shaft, of course—weight properly distributed—ample strength at every point—every part accessible—every detail in construction standard in quality and well-known to the **TRADE**.

Watch the big **users** of commercial cars; talk to them as we have done and you will quickly realize that the requirements for users point **unerringly** to the simple, practical, easily-cared-for, quiet-running electric. The "M. & P." 1000 lb. Electric is the car buyers want. In efficiency, in quality, and in price it meets today's needs today. Meets them as does no other electric of any type at any price.

The M. & P. Electric sets a new standard in quality, service, efficiency and economy. Scrutinize the brief specifications herewith and you will see at once why the M. & P. 1000 lb. Electric will meet with instant approval. Why it offers you, Mr. Dealer, an unusual opportunity to land immediate sales.

Dealers Note These Facts

You will see at once that here is a selling proposition that means business for you. The more you know about electrics, the quicker you will appreciate the wonderful opportunities offered you by the M. & P. We are in our new factory and ready to close territories. First come, first served. Deliveries begin April 15th. Sample car can be seen now. Write, wire, or come to the factory. Quick action wins. Catalog yours on request.

M. & P. ELECTRIC VEHICLE COMPANY
Franklin and Dubois Sts. Detroit, Michigan

SPECIFICATIONS

that prove Efficiency and Quality

FRAME—Standard 3" Channel, riveted and amply supplied with cross members.

FRONT AXLE—Weston Mott drop-forged "I" beam.

REAR AXLE—Weston Mott square forged shaft.

JACK-SHAFT—Weston Mott latest commercial vehicle type.

BEARINGS—Big cups and cones and balls used throughout.

MOTOR—Westinghouse, 80 volts, suspended directly under driver's seat, can be removed by simply sliding out three bolts. Westinghouse Continuous Torque controller mounted under driver's seat.

BATTERIES—40 Gould cells, guaranteed for one year.

SPRINGS—Full elliptic front and rear.

STEERING—Worm and sector gear with 15" wheel. Tiller type if desired.

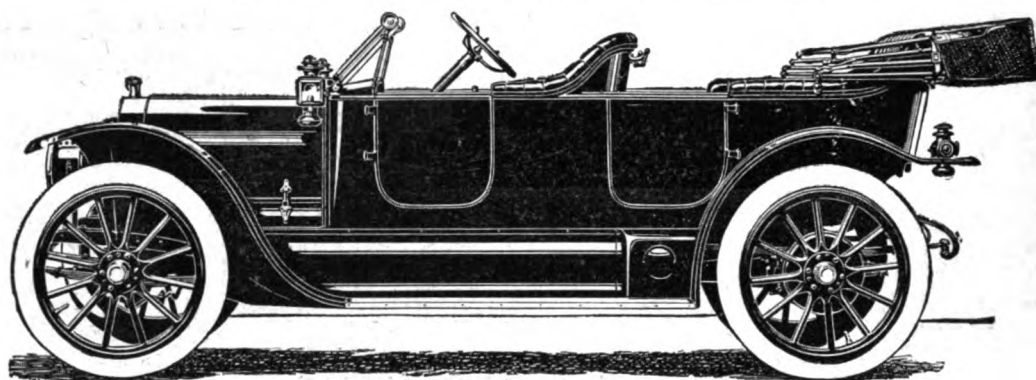
WHEELS—32" S. A. E. Artillery type. 12" x 1 1/4" spokes.

TIRES—2 1/4" solid.

BRAKES—14" brake on rear wheels. Expanding 10" brake on jack-shaft operated from pedals.

WHEEL BASE—100". Tread 56".

The Rambler Cross Country Has Made Good



The Rambler Cross Country—\$1650

We Guarantee Every Rambler for Ten Thousand Miles

Subject to the conditions of our signed guarantee which we will give with each car

Ten thousand miles! Think what it means!

Step into the Rambler in New York and journey across four states to Chicago. Take your bearings and strike due west across seven states to the Golden Gate.

Run down the Coast to Los Angeles. Turn back over the mountains and on through eight hundred miles of desert to El Paso. Then on to New Orleans and back, by way of Atlanta, through eight states to the city of New York.

Strike out again cross country for Chicago. Then drive your car straightway across the American continent to San Francisco. Yet you

have not exhausted the ten thousand mile Rambler guarantee backed by a company of known stability.

We give this guarantee to prove to you our unbounded confidence in every single part that goes into every Rambler car.

The first Rambler Cross Country that left the factory made a three thousand mile test trip through nine states, over the mountains of Pennsylvania to New York, Albany, Boston and back to the factory.

Since then the fame of the Cross Country has spread, and its service has extended to every state in the Union, to every province of Canada, to Mexico, to Australia, South America, Europe and the Orient.

Everywhere this Rambler has gone its performance has strengthened our confidence in its ability to fulfill this guarantee. That is why we do not hesitate to give it.

Eleven years of success in motor car building has so established the stability of this company in manufacturing and financial resources as to make definitely known the responsibility back of this guarantee.

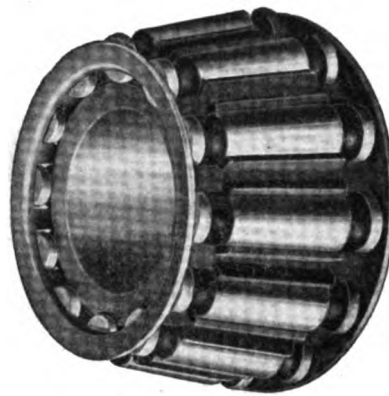
Such a car with this guarantee, backed by such a company whose liberal policy is so widely known, are the reasons why you should have a Rambler. A postal card will bring you a catalog at once.

Equipment —Bosch duplex ignition. Fine large, black and nickel headlights with gas tank. Black and nickel side and tail oil lamps; large tool box; tool roll with complete tool outfit. Roomy, folding robe rail; foot rest, jack, pump and tire kit. Top with envelope, \$80—wind shield, \$35—demountable wheel, less tire, with brackets and tools, \$30—gas operated self-starter, \$50.

The Thomas B. Jeffery Company
Main Office and Factory, Kenosha, Wisconsin
Branches: Boston, Chicago, Cleveland, Milwaukee, New York,
Philadelphia, Sacramento, San Francisco



**All the weight
of the car and
its load, comes
on the bearings.**



Whether it's a huge touring car or a ten-ton truck—every bit of the weight of the car and its load, comes on the bearings in the wheels.

All this great pressure comes below the center of the bearing.

So each bearing must stand its share on less than half of its rollers or balls.

Now add the hammer-like blows that come from jolting over rocks and from dropping into ruts. You'll wonder how the bearings ever manage to stand up.

TIMKEN

TAPERED ROLLER BEARINGS

A roller supports weight along its entire length—a ball only at a point.

Given the same diameter, the roller will carry much greater load.

Or, putting it the other way about, take a roller of given diameter—the ball that will support as great a load must be very much larger. And even then the pressure all comes on a point.

Why isn't it better to distribute the weight and the shocks and

strains over the length of a roller?

That is just what the Timken *Roller Bearing* does.

That is one of the many reasons why it is installed by the great majority of pleasure and commercial car builders in the wheels of their cars.

It will interest you to know the names of the cars that use Timken Roller Bearings. Write for booklet "The Companies Timken Keeps."



THE TIMKEN ROLLER BEARING COMPANY
Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is The Timken-Detroit Axle Company.



Overland

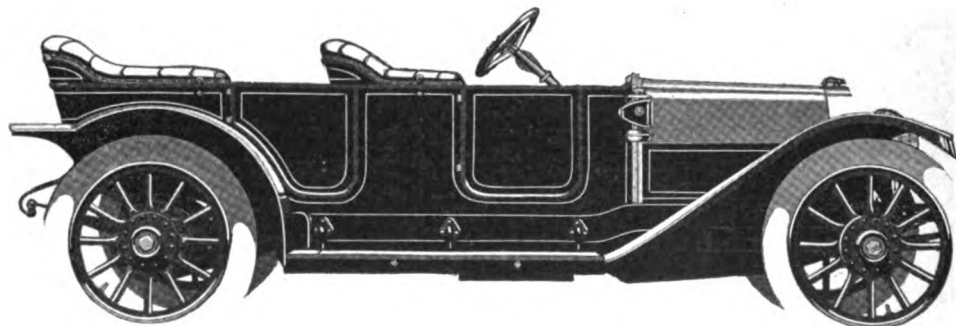
¶ Any Overland car sells at from 20 per cent. to thirty per cent. less than any other similar type of cars on the market.

¶ Our \$1500 forty-five horsepower five-passenger touring car is a good proof of this. A forty-five horsepower touring car usually sells for about \$1800. A careful comparison will prove that there is but little difference between our \$1500 and the average \$1800 car.

¶ Make it a point to see the Overland line. These cars are the product of the greatest factories in the industry. They represent the result of scientific management. Above all, they prove what a factory of the largest capacity can do in the way of economical production.

¶ Send for our interesting catalogue. Ask for book I-43.

The Willys-Overland Co., Toledo, Ohio



Model 61-T—\$1500

Wheel base, 115 inches; body, 5-passenger fore-door touring; motor, $4\frac{1}{2} \times 4\frac{1}{2}$; horsepower, 45; Bosch magneto; tires, 34 x 4 inch Q. D.; finish, Brewster green, ivory stripe, all bright parts nickel-plated; 3 black and nickel oil lamps; 2 black and nickel gas lamps. Price, \$1500.



1,001,813. Engine Starting Crank. Charles E. Carol, Indianapolis, Ind. Filed July 5, 1910. Serial No. 570,336.

1. The combination with an engine shaft having a thread thereon, of a starting crank aligned with said shaft and provided with a mating thread, the said two threads being so formed that one will disengage from the other in either of two axial relations, a ratchet and retaining pawl to normally prevent reverse rotation of the starting crank, and a yielding abutment yieldingly resisting relative axial movement of the two parts beyond engagement during forward rotation of the crank shaft.

1,001,881. Vehicle Signal. Leo O'Brien, Montclair, N. J. Filed Jan. 19, 1910. Serial No. 538,860.

In a vehicle signaling device, the combination with a vehicle, of a bracket secured to the rear thereof, formed with a fulcrum pin, a rearward extending arm located at one side of the fulcrum pin and provided at its end with a shield and a stud on the side of the fulcrum pin opposite the said arm, a semaphore pivotally supported on the fulcrum pin and arranged when turned into one position to lie behind the said shield and when turned into another position to rest against the said stud, an electric lighting device supported by the said stud and arranged to co-act with contact devices on the semaphore when the latter rests against the stud, in order to complete the lighting circuit, and means accessible to the operator of the vehicle for moving the semaphore from one of its said positions to the other.

1,001,886. Demountable Rim. Elwood C. Phillips, Chicago, Ill., assignor to Phillips Demountable Rim Company, Indianapolis, Ind., a Corporation of Indiana. Filed June 24, 1910. Serial No. 568,630.

1. A wheel provided on its periphery with a series of wedges, and a rim provided on its inner side with a series of wedges, the different series of wedges co-operating one with the other, the wedges of one series having each a projection thereon, and the wedges of the other series having each a recess therein and extending circumferentially farther at one side than at the opposite side of the recess.

1,001,891. Security Bolt for Vehicle Wheel Tires. John David Rowland, Birmingham, England. Filed Sept. 12, 1910. Serial No. 581,525.

In caps or covers for the security bolts of vehicle wheel tires, the combination comprising a nut, a washer rotatably attached to the nut, and a pair of tubular portions adapted to inclose without engaging the projecting end of the bolt, one of the said portions being fixed to the nut and the other provided with a closed end and arranged to slide axially within the fixed portion, substantially as described.

1,001,939. Wheel. Frank F. Eno, Jamaica Plain, Mass., assignor of three-eighths to Edwin Elliott Turner, Jamaica Plain, Mass. Filed Jan. 28, 1911. Serial No. 605,197.

A spring wheel consisting of an inner wheel having a rigid arm, an outer rim

comprising a flat, flexible metal band concentric therewith, and a series of overlapping coiled springs extending circumferentially of the wheel, diagonally across and between the rims, and rigidly secured to each rim, substantially as described.

1,001,950. Carburetter. Thomas J. Hart, Jewettville, N. Y., assignor to Sherwood Manufacturing Company, Buffalo, N. Y., a Corporation of New York. Filed Nov. 26, 1909. Serial No. 529,854.

1. A carburetter comprising a mixing tube provided with a plurality of spiral partitions which divide the same into a plurality of spiral longitudinal mixing passages, and means for supplying air and gasolene to said passages.

1,001,969. Carburetter. Edward Maynard, Detroit, Mich. Filed Sept. 17, 1910. Serial No. 582,455.

1. A carburetter comprising a substantially cylindrical upright casing, a boss on the lower end of said casing having a transverse passage therethrough in communication with the interior of the casing, a ported sleeve closed at one end and adapted to turn in the boss, the sleeve being reversible end for end therein, a lateral extension on the casing having an exhaust passage therethrough from the interior of the casing, a throttle valve controlling the flow of air from the interior of the casing to the extension, and an automatically opening relief valve in the extension adapted to admit air thereto from outside the casing.

1,001,982. Vehicle Wheel. John H. Reed, Lancaster, Wis. Filed June 13, 1910. Serial No. 566,614.

1. In a wheel, a felly comprising a plurality of connected sections, a hub, a resilient annulus mounted in the hub, and spokes connected to the felly sections and having each a resilient section bearing against the said annulus.

1,002,003. Steel Tire. Christian J. Simonson and Theodore Fagervik, Minneapolis, Minn. Filed July 23, 1910. Serial No. 573,581.

In a tire, including a felly and a shell forming a tread for the felly, of oppositely disposed bracket members, one positioned upon the felly and the other positioned upon the shell, each of said bracket members being provided with longitudinally and transversely arranged openings, said openings being each of a rectangular formation, flattened spring ring members engaging the corresponding transverse and longitudinal openings, substantially as and for the purpose set forth.

1,002,011. Odometer. Amasa Trowbridge Hartford, Conn., assignor to The Veeder Manufacturing Company, Hartford, Conn., a Corporation of Connecticut. Filed Jan. 5, 1911. Serial No. 600,973.

1. The combination with an axle having parallel holes in the end thereof and a hub, of a cap secured to the hub, a registering device mounted on the cap to rotate therewith, and a loose driving connection between the registering device and the axle, the same comprising a forked driver engaging said parallel holes in the end of the axle and driving connections between the driver and the registering device.

1,002,015. Odometer. Curtis Hussey Veeder, Hartford, Conn., assignor to The Veeder Manufacturing Company, Hartford, Conn., a Corporation of Connecticut. Filed Jan. 12, 1911. Serial No. 602,191.

The combination with a wheel hub, of a register supported by the hub with its axis transverse to the axis of the hub, a worm shaft and worm supported by the hub and adapted to have a loose engagement with the axle of the wheel, a driving shaft for the register mechanism, a worm wheel mounted loosely on the driving shaft, two pawl carriers mounted on the driving shaft to rotate therewith, an internal ratchet wheel connected with the worm wheel and co-operating with one of said pawl carriers and a stationary internal ratchet wheel co-operating with the other of said pawl carriers to prevent reverse rotation of the driving shaft.

1,002,016. Odometer. Curtis Hussey Veeder, Hartford, Conn., assignor to The Veeder Manufacturing Company, Hartford, Conn., a Corporation of Connecticut. Filed Jan. 12, 1911. Serial No. 602,193.

The combination with a wheel hub, of a register supported by the hub, a shaft supported by the hub, an arm secured to the shaft and adapted for engagement with a stationary eccentric pin carried by the axle, a pawl carrier secured to the shaft, a pawl carrier thereby, a ratchet wheel mounted to rotate on said shaft and engaged by said pawl, a gear secured to said ratchet wheel and a register driving gear engaged by said last named gear.

1,002,035. Automobile Air Pump. Antoine M. Clement, New York, N. Y. Filed Nov. 8, 1910. Serial No. 591,282.

1. An automobile air pump comprising a pivot post; a clamp for operatively engaging said post with the cap nut of an automobile driving wheel; a supporting plate pivotally mounted on said pivot post; an operating mechanism rotatively mounted on said pivot post; an air pump embodying a cylinder and a reciprocating piston, said cylinder being mounted on said supporting plate; and a latch for operatively connecting said pivot post and said operating mechanism.

1,002,040. Shock Absorber. John T. Costello, Pittsburgh, Pa. Filed Dec. 5, 1910. Serial No. 595,751.

1. A shock absorber comprising a supporting member, an air tight casing around said member and forming a socket connection, a resilient block between said member and casing having inner and outer annular flanges bearing against said member and casing, respectively, and a resilient tube between said member and casing having air under pressure within and around the same.

1,002,046. Elastic Tire. Giles S. Doty and John D. Show, Philadelphia, Pa., assignors to D. & S. Airless Tire Company, a Corporation of Delaware. Filed Jan. 10, 1911. Serial No. 601,889.

1. A tire comprising a hollow annular member, independent semi-rigid projections extending into the tire, and a reinforced resilient band connecting said projections and adapted to expand upon separation of the projections when the tire is depressed.

1,002,071. Windshield. Earnest Meier, La Crosse, Wis. Filed Mar. 21, 1911. Serial No. 615,905.

A device of the class described, comprising a supporting member made up of two parts movable longitudinally with relation to each other, a longitudinally extending slot in each part, means engaging the parts and contained within the slots for holding the parts in fixed position, a shield carried by each part, uprights carried by the said

supporting member, the said uprights being each provided with a slot, a horizontally extending member made up of two parts movable relatively to each other, each part having a threaded end portion engaging in one of the said slots in the uprights and each provided with a shield, means engaging each of the last-named parts whereby they may be held in fixed relation, all of the said shields being movable relatively to one another whereby the size of the shield as a whole may be varied, the said supporting member being provided with end portions adapted to engage the frame of an automobile whereby the shield may be supported adjacent the radiator thereof.

1,002,099. Gasolene Strainer. Harold D. Waterhouse, Quincy, Mass. Filed Oct. 6, 1909. Serial No. 521,267.

1. In a gasolene strainer, the combination with a body constituting a settling chamber, of a cap for the body provided with a central discharge chamber communicating with the settling chamber and also provided with an annular inlet chamber that surrounds the discharge chamber and is separated therefrom by a wall, said inlet chamber communicating with the settling chamber near the periphery thereof, a conical strainer between the inlet chamber and the discharge chamber, and a holder for the strainer clamped between the body and the cap.

1,002,110. Spring Wheel Structure. William P. Airheart, Detroit, Mich. Filed Mar. 15, 1911. Serial No. 614,555.

A vehicle wheel comprising inner and outer rims, the inner rim consisting of opposed rings attached to the felly in parallel relation to project beyond the face thereof, semi-elliptic springs rigidly secured to the outer rim, a plurality of links pivoted at one end between the projecting rings forming the inner rim and held by the sides of said rings against lateral movement, the other ends of said links being pivotally coupled to the free ends of said springs.

1,002,114. Automobile Fender. Harry De Bow Barnes, Bradley Beach, N. J. Filed Sept. 16, 1910. Serial No. 582,355.

1. In a device of the kind described, the combination with the wheels of a motor vehicle, of a pair of shields mounted on and adapted to cover a portion of the periphery and sides of the wheels, devices for connecting the shields together, a fender connected to the inner sides of the shields and extending across the front part of the vehicle, and devices for securing the shields to the knuckle joints of the vehicle.

1,002,154. Vehicle Wheel. Allen James, Caple, Okla. Filed Mar. 2, 1911. Serial No. 611,818.

In a spring wheel such as described, an axle, a ring spaced from said axle, internally cut teeth formed on the inner face of said ring, an outer rim, spokes connecting said ring with said outer rim, disks, each having a shoulder secured in said axle, said ring adapted to slide between said disks, a coil spring mounted between said axle and said ring, one end of which is secured to said axle, a shoe provided with teeth mounted on the opposite end of said coil spring, the said teeth on said shoe adapted to engage said internally cut teeth formed on said ring when the said axle is rotated to rotate said wheel.

1,002,188. Control Mechanism for Change Speed Gearing. Horace T. Thomas, Lansing, Mich., assignor to Reo Motor Car Company, Lansing, Mich., a Corporation of

Michigan. Filed Nov. 8, 1909. Serial No. 526,698.

1. A gear control device, having in combination a shaft adapted to turn and reciprocate in the direction of its length, a control lever pivoted to said shaft so as to be capable of turning in a plane parallel to the axis of said shaft, said lever being adapted to turn at a point midway its length in said guide in a plane at right angles to said guide, a guide plate provided with grooves supported opposite said guide, said lever being provided with a finger extending into said grooves, a sleeve surrounding said shaft provided with an actuating arm and extending beyond said lever, a fixed pivot supported by said guide plate in line with said first-mentioned shaft and fixed pivot, said sleeve bearing on said shaft, and a brake lever on said sleeve outside of the control lever, substantially as described.

1,003,431. System of Motor Control. Alexander Churchward, New York, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Apr. 9, 1909. Serial No. 488,841.

1. This method of controlling a motor, which consists in operating it as a series motor, and as a cumulative compound generator when it is overhauled by the load.

1,003,464. System of Motor Control. Leopold Janisch and Willy Linke, Berlin, Germany, assignors to General Electric Company, a Corporation of New York. Filed May 7, 1909. Serial No. 494,578.

1. In combination, a motor, a generator supplying current thereto, and means driven by said motor for automatically weakening the field of said generator upon a decrease in the speed of said motor whereby upon the occurrence of an overload on said motor it is slowed down.

1,003,494. Roller Bearing. John Newmann, Brooklyn, N. Y. Filed June 13, 1910. Serial No. 566,476. Renewed July 29, 1911. Serial No. 641,383.

1. A roller bearing, comprising annularly grooved rollers, centrally recessed loose blocks interposed between and partly embracing the said rollers and balls contained in the recesses of said loose blocks and extending outward at both sides of the same and engaging the annular groove of the said rollers.

1,003,531. Engine Muffler. Lonnie C. Smoot and William R. Masterson, Hillsboro, Tex. Filed Sept. 6, 1910. Serial No. 580,731.

1. An engine muffler, comprising a casing and a plurality of semi-circular sections arranged therewithin to form a continuous spiral passage through the casing, the sections adjacent to the muffler inlet having central apertures, and the remaining sections having closed conical centers with their apices toward the muffler inlet.

1,003,535. Internal Combustion Engine. Peter H. F. Spies, Port Chester, N. Y., assignor of one-half to James F. Keenan, Port Chester, N. Y. Filed Dec. 21, 1908. Serial No. 468,461.

1. In an explosive engine the combination with a cylinder having an admission port and an exhaust port, of a piston arranged to reciprocate in said cylinder and provided with a transverse chamber arranged to communicate with the admission and exhaust ports, said chamber having two ports by which it may communicate

with the working chamber of the cylinder, a plunger linearly movable in said chamber and controlling said ports therein, a connecting rod, and means governed by the angular swing of the connecting rod for moving said plunger within the chamber of the piston.

1,003,551. Anti-Friction Bearing. Concord Upton, Baltimore, Md., assignor to Simplex Koller Bearing Company, New York, N. Y., a Corporation of New York. Filed June 8, 1911. Serial No. 631,913.

1. An anti-friction bearing comprising inner and outer concentric race rings having races, the inner race ring having a peripheral groove and being provided with annular wearing surfaces at the sides of said groove, said inner race ring having radial flanges without said annular surfaces and spaced apart, working rollers between the race rings and located in said groove, separator rolls between the working rollers and bearing against said annular surfaces, and a retainer encircling said separators and having openings spaced apart on opposite sides of the separators through which the working rollers project.

1,003,559. Storage of Acetylene. Milton C. Whitaker and Floyd J. Metzger, Yonkers, N. Y., assignors to Harry E. Robinson, Brooklyn, N. Y. Filed May 2, 1911. Serial No. 624,672.

1. An improvement in the storage of acetylene comprising a container constituted in whole or in part of a metal of the copper group, a porous filler contained therein, acetone therein, and a substance soluble in acetone which will decompose acetylids and which will prevent the formation of acetylids.

1,003,656. Collapsible Cover or Hood for Motor and Like Vehicles. Wilhelm Reutter, Stuttgart, Germany. Filed May 6, 1910. Serial No. 559,746.

1. In a collapsible cover for automobiles, a frame, rear window bars pivoted there at their lower ends respectively, upper bars pivoted at their rear ends to the upper ends of the rear bars and adapted to fold downwardly against the front face of the rear bars, front stays pivoted to the front end of the upper bars and foldable backwardly toward the upper face of the upper bars, and intermediate stays pivoted to the upper face of the upper bars and foldable backwardly.

1,003,668. Spring Wheel. Alfred J. Swing, Cincinnati, Ohio, assignor to The Auto-Spring Wheel Company, Cincinnati, Ohio, a Corporation of Ohio. Filed Oct. 3, 1910. Serial No. 585,124.

1. A wheel, comprising a first member surrounding the wheel axis at right angles to said axis and provided with a circumferential series of radial arms, a second member similarly surrounding the wheel axis and formed with two parts, each of the parts being provided with radial arms in alignment with the radial arms of the first member, one at each side of said first member, one of said members being secured to the hub of the wheel and the other to the rim of the wheel, and a circumferential series of spring devices extending across between the two parts of said second member and having their ends attached to the radial arms of the two parts of the second member and having their central portions permanently attached to the radial arms of said first member, combined substantially as set forth.

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15 cents per line of seven words, cash with order.
In capitals, 25 cents per line.

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MILLSTONES.

This is particularly true in respect to the purchase of automobiles and many hundreds of people annually suffer the consequences of ill-advised purchases from firms that engage in re-selling cars that never should have been on the market. The moral is

INVESTIGATE

for yourself very carefully before you buy a car, and especially a second-hand car. It will no doubt interest you to learn what else we may have to say on this subject. If so, write E. R. THOMAS MOTOR CAR CO., 1200 Niagara Street, Buffalo, N. Y.

BARGAIN—\$750 will buy a nearly new Mitchell 5-passenger automobile. New tires, Bailey tread, top, windshield and all accessories complete. Cost \$1,500. As good as new, owing to short length of service. THE TRIUMPH ELECTRIC CO., Cincinnati, O.

AUTO WANTED—Will exchange building plot in part payment. BOX 236, Ridgewood, N. J.

WANTED—Foremen; also production manager for large automobile factory; must be thorough mechanic in automobile manufacture, possessing executive ability of highest order; want foremen for first and final assembly and machine departments. State age, experience, references, salary wanted. 218 State Life Building, Indianapolis, Ind.

LOZIER Touring Car, Model 7, 40 horsepower, good condition. JACOB HAGNER, 52 East Court St., Cincinnati, O.

AUTOMOBILE owners and agents, a new device for repairing automobile tires, lengthens life of tire, quick and permanent, quick seller. Investigate. THE OSAGE NOVELTY CO., Osage, Iowa.

ENGINE, 3½ H. P., Uncle Sam, Schebler carburettor and full equipment for 22 foot launch for sale or exchange for motorcycle. STEELE, 15 Maiden Lane, New York.

GARAGE FOR RENT—Most prominent corner in Bergen section of Jersey City; entrance on two streets; floor space about 170 x 50 on ground floor, 100 x 50 on second floor; brick building with elevator. Apply to owner, T. W. LEAKE, Bergen Ave. and Montgomery St., Jersey City.

SALESMAN—One who is now visiting automobile trade in general, to take side line. Liberal arrangements made. Attractive proposition. BOX 200, care Motor World.

PEERLESS AUTO TOP DRESSING—Waterproofs and makes faded and stained mohair and cloth tops look like new. Leaves the cloth soft and pliable. Not one complaint. Have your dealer order today. THE COLUMBUS VARNISH COMPANY, Columbus, Ohio.

FOR SALE—5-passenger body, \$30.00; top, \$15.00; treads, 30 x 3½, \$3.50; frame, \$6.00; all kinds of repairs for Reo and Rambler cars at from one-half to one-fifth of the list price; also new and second-hand cars for sale. SCHISSEL AUTO CO., Cherokee, Iowa.

BRAND NEW TAXICABS, never used, 4-cyl., 30 H. P., Bosch mag., shaft drive, left steer, leather upholstered; cost new \$3,000 each; for quick sale, \$1,350 each. Write for photo. EDGEWATER GARAGE, 5129 Evanston Ave., Chicago, Ill.

AUTOMOBILE WANTED—Will accept auto as part payment on one of our Wenatchee, Wash., orchard tracts; 5 acres; worth \$3,000. Address 417, 112 W. Adams St., Chicago, Ill.

FOR SALE—Pierce-Arrow car, seven seats, fully equipped, late 1911 model, price \$4,000; as good as new, varnish not even scratched. W. F. O'CONNOR, Tariffville, Conn.

HAVE a buyer for a good 1911 or 1912 auto in perfect shape; he will give his personal mortgage on good property for same at 6%. GEO. B. CLARK, Milford, Conn.

MAILING LISTS of Automobile Owners. S. H. CARROLL, JR., Albany, N. Y.

PALM GUM Tire Seal prevents punctures and will keep air from escaping even if punctured by 20-penny nails. Life of tire prolonged. Cost about \$10 on average car. Weighs about 20 lbs. Ask your dealer to get it for you. If he won't furnish it we will, at \$5.00 per gallon—25% with order. PEORIA AUTO & SUPPLY CO., Sole Distributors, Peoria, Ill.

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FLANDERS 1911 4-passenger, used less than 90 days, \$350. COLUMBIA AUTO EXCHANGE, 287 Edgewood Ave., Atlanta, Ga.

FOR SALE—Coupes for immediate delivery. Stylish, up-to-date and well constructed. Fit almost any car. Write us. ROBBINS & CO., Indianapolis, Ind.

AUTOMOBILE TROUBLES—Our books worth dollars to auto owners; free catalog; special offers. NELSON BOOK CO., 42 Nelson Bldg., Barton, Vt.

THE Pocket Auto-Guide; full information; roads, hotels, garages, census, all States; transcontinental routes; satisfaction guaranteed; mail \$1. THE AUTO-GUIDE. Box 1308, Denver, Colo.

ELMORE TOURING CAR, 1911, fully equipped, extra tires, warranted fine condition, like new, great roadster, price \$750, act quick, send for full description. H. J. DANIELS, Norwich, N. Y.

FORD, Buick, Overland, E-M-F, Maxwell, Air-Friction Carburetors drive your cars 3 miles per hour on high. Much more speed, much less gas. Starts easy in cold weather. Satisfaction or refund money. AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

HAVE YOU TRIED the new cotter pin tool; no more skinning of hands; 15 tools in one, at \$1.00. For sale by E. M. WORDEN, Ladysmith, Wis.

CAR OWNERS, preserve your tires with New Tyr—a genuine preservative of rubber. In successful use for years; impervious to weather. Preserves, waterproofs, beautifies tires, worn fabric, tops, running boards, mats. Send 75 cents for pint can at once. NEW TYR MANUFACTURING CO., 771 Lexington Ave., New York City.

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ALL KINDS OF SUPPLIES and Tires at Bargain Prices. CHAS. DOWNING, 1779 Broadway, New York.

BARGAINS in new 4 x 5 4-cylinder auto motors. Equipped. F. E. ALFORD, Goshen, Ind.

SCORED CYLINDERS repaired, \$12 each. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. Better investigate and save money. References, testimonials, and full details on request. WATERBURY WELDING CO., Waterbury, Conn.

IDENTIFICATION CASES. Fine Imported Art-Leather. Handsome designs and colors. In two sizes, for Men's and Ladies' cards. Sent by mail for 10c. and 2c. stamp for postage. Your Monogram or Initials stamped in gold 5c. extra. Also manufacturers of Pocket Mirrors, Tape Measures, Photo Souvenirs, Etc. PLATO-ART COMPANY, 18 Varick St., New York City, N. Y.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

WANTED—Ardsley touring car; state price and condition. C. H. CURTISS, Naugatuck, Conn.

BROKEN CYLINDERS, crankcases, etc., made good as new by welding at about ¼ cost of new parts. No charge unless weld is satisfactory. Write for references and complete information. WATERBURY WELDING CO., Waterbury, Conn.

GARAGE FOR SALE in Iowa. Equipped for auto repairing and painting in all its branches. Box 459, care Motor World.

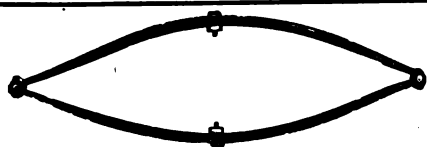
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In capitals, 25 cents per line.

WANTED—By prominent well established automobile manufacturer producing popular priced, high powered, refined line of cars, several high class, up to the minute, experienced salesmen in all parts of the United States—either salary or liberal commissions paid—nothing but high class men will be considered and they must understand their business and be available July 1st. Application must give State, experience, bank and business references. No man over forty years of age will be considered. Address, GENERAL SALES MANAGER, care Motor World.

AGENTS WANTED EVERYWHERE
—Motoring salesman—salesman motoring. Ask us if territory you propose sales-touring is being worked by our agents. Snappy accessory; long commission. YALE COMPANY, 21, Oostburg, Wis.

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SPECIALISTS IN
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High Grade Only
Cleveland, Ohio



Guaranteed Automobile Springs

Our plant is devoted exclusively to the manufacture of high quality springs. All work is oil tempered and warranted. Our circulars contain valuable information. Write.

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Baldwinsville, N. Y.

BLITZ The Polishing Cloth
Quick and Easy Shine
for Auto brasses. Blitz is always ready and the polish is in the cloth. Sample Free, or Full size Blitz Cloth 25c. by mail or at garages.
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TRUFFAULT-HARTFORD Shock Absorber

HARTFORD SUSPENSION COMPANY, 104 Bay St., Jersey City, N. J.
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New York, 212-214 W. 88th St.; Boston, 319 Columbus Ave.; Chicago, 1458 Michigan Ave.; Philadelphia, 250 North Broad St.; Detroit, 870 Woodward Ave.

Apico Electric Lighting System



made for easy
installation on
any motor car.

When you have one on your car your lighting troubles will be over. Write us today, giving make and model of your car. We will recommend an outfit exactly suited to it.

APPLE ELECTRIC COMPANY
18 N. Canal St. Dayton, Ohio, U. S. A.

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only \$1,055.

(38) R. M. OWEN & CO., General Sales Agents
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will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial. Write now.
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Locomobile Cars for 1912

Complete information furnished on request.

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75% Increase in Tire Efficiency

That's what the **INNERSHU** accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.

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ALL SIZES
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by attaching
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You have known the name, Kelly-Springfield, since 1895. If the tires weren't good you'd never see the name today.

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Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Buffalo, Cleveland, Atlanta, and Akron, Ohio.
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This Name on Automobile Tires and Rubber Accessories Signifies Inherent Qualities of Material and Workmanship that Insure the Maximum of Service at the Minimum of Expense. (3487)

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Out out the everlasting repairing!—the agony of punctures, blowouts, and delays. Enjoy unrestricted pleasure—always, always—with **DAYTON AIRLESS TIRES**.

Air-Free—Care-Free—cannot give you.

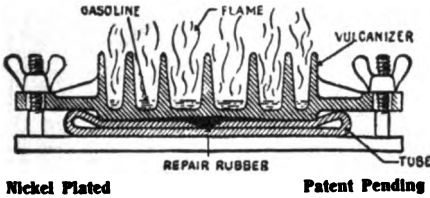
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Repairs the Inner Tube in 15 Minutes

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The Imperial Vulcanizer Repair Kit

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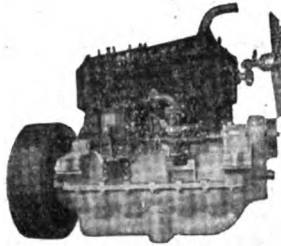
Price **\$3.50**

At your dealer's, or sent by express.

Complete with enough specially prepared rubber for 40 punctures.

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THE MCGRAW TIRE & RUBBER CO.
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“CONTINENTAL”

Continental Model “C”

CONTINENTAL MOTOR MFG. COMPANY
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20 to 60 H. P.
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Manufacturers of high grade auto and truck wheels; also a new ball bearing. Output guaranteed. Best of hickory used. Trial order solicited.

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For Utility Cars
Send for Pamphlet 58

THE MOTZ TIRE AND RUBBER CO.
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A—Shows double-notched treads.
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**ABSOLUTELY
PREVENT
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Cannot injure tires
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Continually shift their position on the tire.

Attached in a moment without the use of a Jack or other tools.

Weed Chains on the front wheels give comfortable easy steering—no cramped fingers—no cramped arms—no sore muscles.

Out of car tracks, ruts, snowdrifts and heavy going; just like steering on smooth roads.

Try them and be convinced.

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Reputable
Dealers



WEED CHAIN TIRE GRIP CO.
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*Tire-by Satisfied,
thank you*



UNITED STATES TIRE COMPANY, New York



Push Over Valve
Press the Lever and It's
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Simple, Isn't It?

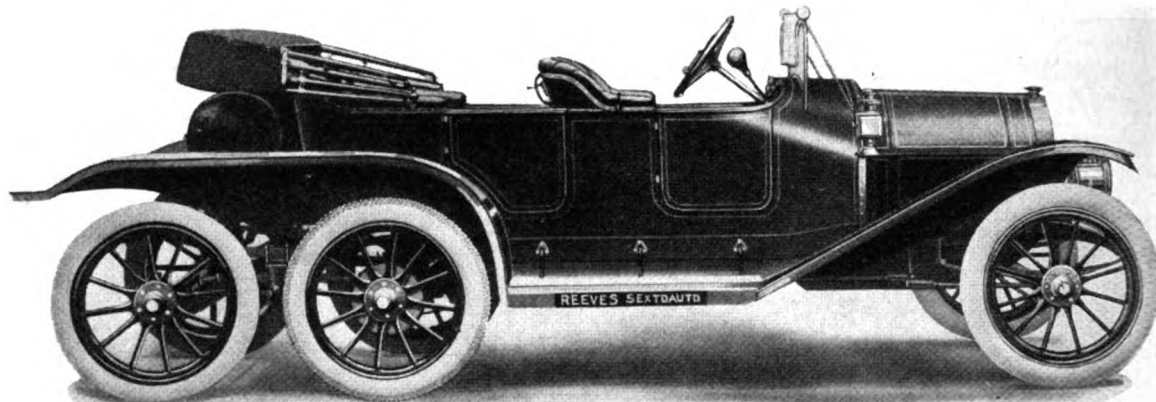
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**NO BOUNCE
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An old and accepted principle to accomplish easy riding applied to the automobile. Not a single experiment embodied in the whole car. It's a phenomenal car, and bound to revolutionize automobile construction where comfort in riding is a consideration. Tire trouble and expense actually reduced. For full information, description and price, address,

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have been approved by leading engineers as the very best for hard exacting service.

If you want to make your car immune to transmission troubles, you should send for complete information regarding the Covert line.

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**LIGHT WEIGHT ALUMINUM
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Known All Over the World as the Best

All Standard Bearings
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"The Best the World Affords"

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1896

K-D

1912

The Motor With the Sliding Crescent Valve

Knight - Davidson

The Sensation of the
Boston Automobile Show

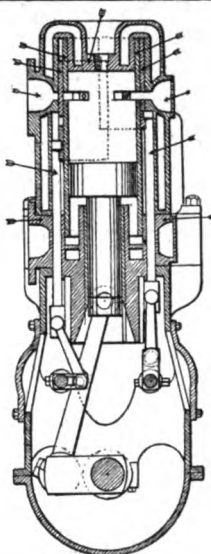
created more comment from the trade than anything else at either show.

Modern Engineering practice has placed the seal of approval on sliding valve practice—

Primarily because this modern conception eliminates springs, and noise, minimizes leaking, and increases port area.

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market.

It is simpler and, consequently, better than any other valve construction known and is here of-



fered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance.

The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize—AND

Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile.

We want to present some facts to interested manufacturers that will be at least worth knowing—facts that if acted on, will add a large percentage of efficiency to the cars you, Mr. Manufacturer, may be turning out.

Knight-Davidson Company
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You Can Bet Your Last Dollar

THAT HE DOESN'T OWN A

"REFLEX"

THE LIGHT THAT NEVER FAILED



Perhaps the man standing at the side of the car is telling the unfortunate motorist about the "REFLEX" but the unfortunate motorist is too "sore" to listen to suggestions. His temper and his language will stand questioning. He'll get a "REFLEX" when he cools down—that's certain. The "REFLEX" Inspection

Light is not only a time, temper and money saver, but a life saver as well. It eliminates all danger of explosion—no soot—no smoke. All parts of object seen at one time. Full details of its construction and efficiency together with price lists mailed on request. Send now.

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AN exceptional plug and a radical sales policy has been adopted for the benefit of the consumer and dealer on

STURDY Spark Plugs

GUARANTEED FOR LIFE

Details upon writing
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(Guaranteed 5000 Miles)

Last Year's Records Make This Year's Sales

AJAX TIRES made a record for Service and Durability in the 1911 Glidden Tour which has never been equalled by any other tire on the market and which proves conclusively that AJAX TIRES are the leading Quality Tires for Touring.

This remarkable showing of AJAX TIRES has attracted the attention of car-owners all over the country, and will make a lot of good AJAX Business for the AJAX Dealer this coming season.

We still want a few more AJAX Dealers to help us meet the demand for AJAX TIRES. Any Dealer who feels like increasing his sales and profits, should write us without delay.

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Moline

"King of the Road"

The Aristocrat of American Roadsters

This handsome, roomy, foredoor, straight line car with big artillery wheels and tires, has every desired refinement. In addition it is equipped with the famous

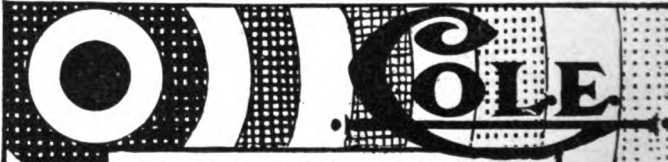
4x6 Long Stroke Motor

unequalled in efficiency, silence of operation and durability. While rated at 35 H. P. this motor will actually develop almost 40. The Roadster shown here is only one of the four New Models of the "Dreadnought" Moline "35." Write for Folder No. 39 showing all styles, specifications and prices.



Dealers will find our latest proposition specially interesting

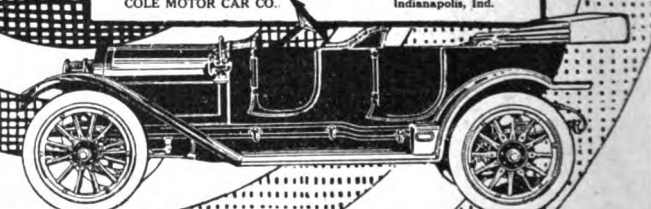
Moline Automobile Company (11)
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COLE

Ward Leonard Dynamo Electric Lighting System, Self Starter, vacuum power plant, 457 x 517 motor, enclosed valves; Bosch ignition; Tinsley axle equipment; 36 x 4 in. wheels; demountable rims; 122 in. wheelbase; nickel trimmings; Seven bodies. \$1885.

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THE MIXER



Price \$3.00

Saves 10 to 25 Per Cent gasoline. Fits intake pipe. Spins around at great speed and "mixes the mixture." We send it to you on trial. If not satisfactory your money is cheerfully refunded.

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Manufacturers of Raybestos Friction Facing, Duplex and Raymond Brakes

THINK THIS OVER very carefully and read it twice, if necessary

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly - tuned up to its highest power. Perhaps the valves pit - warp - go out of shape - fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

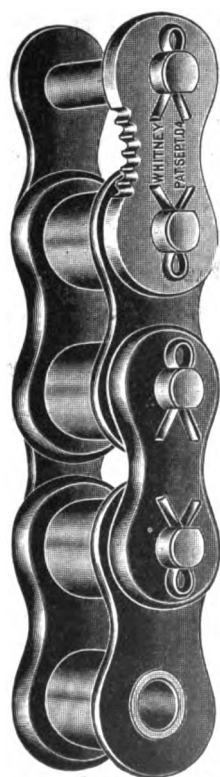
Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

THE ELECTRIC WELDING PRODUCTS COMPANY

CLEVELAND, OHIO



WHITNEY

The Most Practical Chain for Motor Trucks

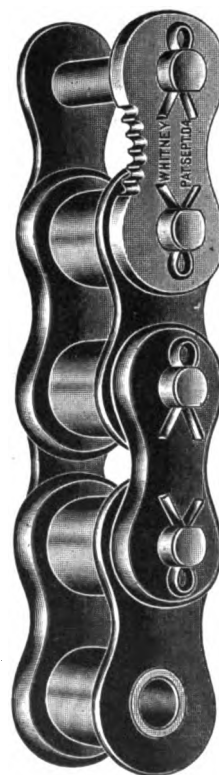
Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

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"Whitney" Chains Are Built for Strains

The Whitney Manufacturing Co.

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Jewel Mica Spark Plugs

Unaffected by Oil or Soot

MADE to resist high temperatures, the firing points are a special alloy which withstands heat without oxidization. Pittsfield Plugs produce intense concentrated sparks, give quick explosion, are sootless and will not break. They spark 365 days in the year without a miss.

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*Full line carried.

Write for Catalog describing the entire Pittsfield Line of Ignition Specialties.

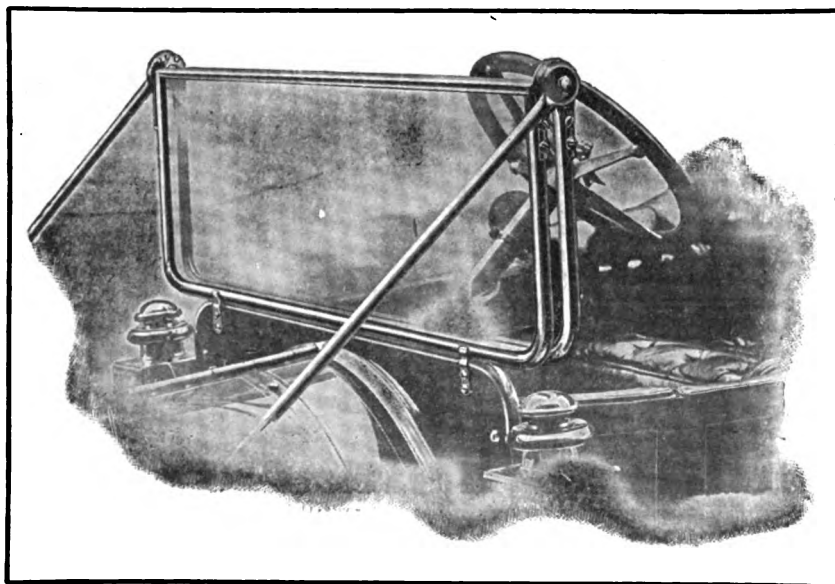


Single Pointed
\$1.00

Double Pointed
\$1.10

KINWOOD WINDSHIELDS

Made by the Manufacturer of One of the Most Comprehensive Lines of Auto Parts Made in America.



Don't delay in sending for 1912 Proposition on KINWOOD WINDSHIELDS.

We have something in this Proposition mighty convincing to the Trade.

You can't afford to omit looking over this Proposition because we are a big factor in the Windshield business today, and can help you in this end of your business nicely. Write now.

The Kinsey Manufacturing Co.
TOLEDO, OHIO

You Need Speedo

IT'S GUARANTEED

Price
\$3.50
With
Decarbonizer
High Power
Models Upward

It will save you 20 per cent. in gasoline, increase power of motor 20 per cent. and is a positive preventive of carbonization.

How It Works—SPEEDO breaks up, under spray, each particle of gas after leaving carburetor, injecting additional air, automatically. Makes easy cold weather starting and is sold only Under Guarantee of Absolute Satisfaction. Ask your dealer.

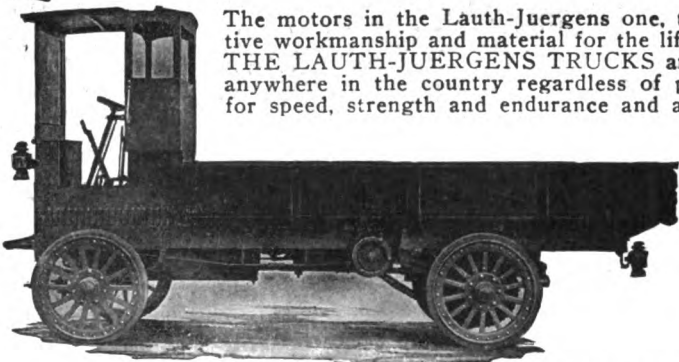
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ONE, TWO AND THREE TON TRUCKS

Guaranteed
for Life



The motors in the Lauth-Juergens one, two and three-ton trucks are guaranteed against defective workmanship and material for the life of the truck—CAN YOU ASK MORE?

THE LAUTH-JUERGENS TRUCKS are the latest and most powerful built trucks to be had anywhere in the country regardless of price or make. They hold an unquestionable reputation for speed, strength and endurance and are built for years of hard service. They are constructed of the best materials obtainable, bear the finest workmanship the world affords and are manufactured in our own shops—TRANSMISSION, JACK SHAFT, CLUTCH, GEARS AND ALL. That's why Lauth-Juergens trucks are real delivery insurance. Send for complete specifications and our 1912 catalogue telling the story of another great success in motor truck building. Reliable agents should communicate with us at once for 1912 territory. Lauth-Juergens Trucks Are Delivery Insurance.

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Bleil Auto Truck Sales Agency, 453 Dix Ave., Detroit, Agent for Southeastern Michigan.
District of Columbia and Vicinity—Bowles Motor Sales Co., Inc., 1608 14th St., N. W., Washington, D. C.

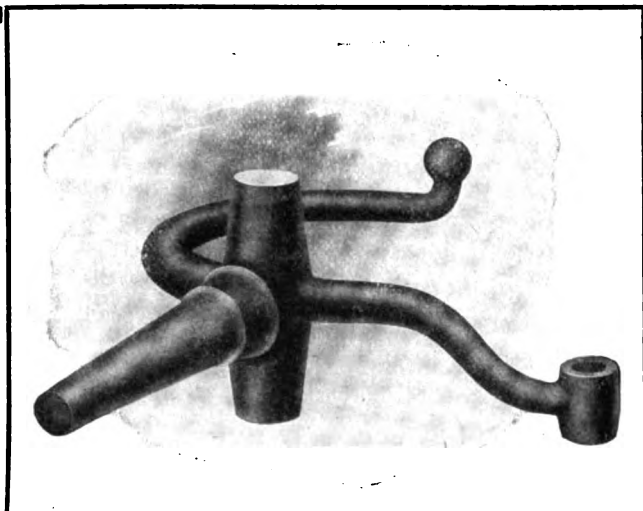
Chicago—Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
Newark, N. J.—Merchants Motor Car Co., Essex Building.
Toledo, Ohio—Greasser Motor Co., 100-104 Ottawa St.

SPECIFICATIONS OF ONE-TON TRUCK

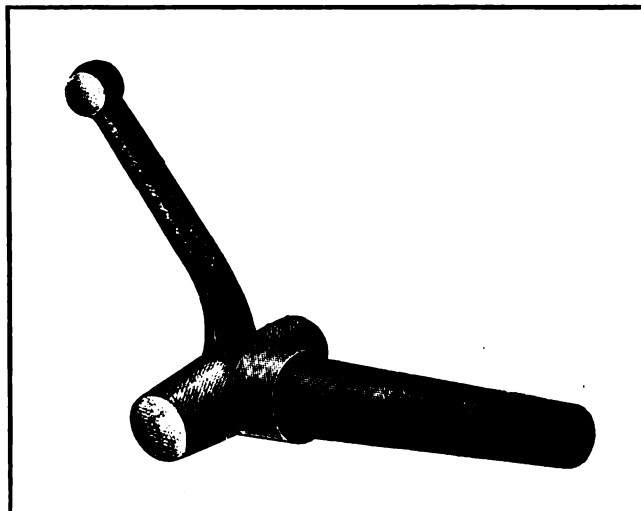
Motor—Rutenber, four cylinder, water cooled, 4" bore, 4" stroke. Carburetor—Schebler, float feed type. Ignition—Bosch high tension magneto, dual system. Transmission—Selective type, four speeds forward and reverse. Clutch—LJ Patent disc, 3

piece, simple and positive. Brakes—Two internal on rear axle, two external on jack shaft. Drive—Double chain. Axles—Ball bearing; front, 1 3/4"; rear, 2". Wheels—36" front and rear, Artillery type. Tires—36 x 3" front, 36 x 3 1/2" rear. Frame—Solid an-

gle steel 2 x 3", supported by long truss rods to prevent vibration. Wheel Base—105". Tread—56". Equipment—3 lamps, horn, oil can, full set of tools and jack. Weight—Chassis with driver's seat, 2600 lbs. Price—Chassis with driver's seat, \$1950.00 F. O. B. Fremont, Ohio.



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in making and treating

Drop Hammer Forgings

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THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio



(Patented)

By
Actual
Test

The Sparks-Withington One-Piece-Blade RADIATOR FAN will deliver a greater volume of air with less horsepower consumption than any other fan on the market. Bonafide tests furnished to those interested.

With this assurance, and considering that we are specialists in fan construction where you are not, we desire the opportunity only to prove our claims, and, therefore, request your blue prints or a sample fan for estimate. Out of ten standards no doubt we can give you something without making special tools. That would mean a saving to you.

We will gladly test free of charge and submit report on fans you now employ.

Don't fail to write us when you are ready to consider 1912 contract.

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Battery Boxes

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ESTABLISHED 1871

Diamond Tires

We could build them cheaper
But We Won't

We would build them better
But We Can't

ANOTHER good reason why you should sell Diamond Tires is this:

¶ No Diamond dealer ever has a chance to complain about Diamond service to dealers.

¶ The Diamond policy is co-operation. You get Diamond service regardless of the number of tires you buy. The small dealer is as important to us as the largest.

¶ If you sell Diamond Tires you not only sell the best tires made, but you get sizes and styles that you need when you need them, and they are always clean, new fresh tires.

If you are not getting our little magazine for dealers, send your name in today. Your name should be on our list and we want it there.

The Diamond Rubber Company

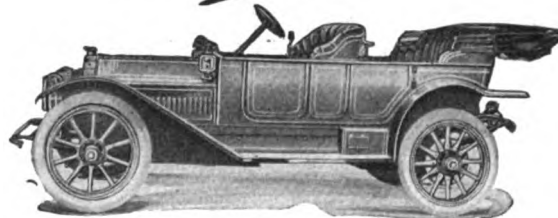
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Glide



Glide Cars have proved themselves the Car for the biggest part of the map. 50 to 1 are Glide Car prospects to the one-year cars. And Glide Cars make no sacrifice for service. They stand as surely for comfort, class and performance as for long-efficiency.

45 H. P. 5-Passenger Torpedo	2,150
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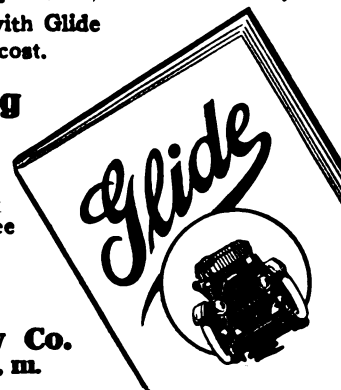
All Glide Cars provided with Glide self-starter without extra cost.

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of convincing specifications. Glide owners are insured by a stronger **GUARANTEE** than any other automobile guarantee in force.

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER UNIVERSAL Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is $2\frac{1}{2}$ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price \$1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City



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want a smooth-running motor, don't you?

Equip your motor with a set of "AC STAR" spark plugs and you will be able to run at top speed and throttle down with no danger of back-firing, as the superior design of "AC STAR" plugs prevents pre-ignition.

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By specialization we have mastered the engineering problems of cone clutches to a point where we have for some time been able to supply clutches that meet the most exacting requirements of any given working conditions. State the conditions and we will show you what we can do, just as in the case of universal joints. Blue prints will help. Designers and manufacturers are getting to appreciate us more and more, because our products are right when they come, are right when the bill comes, and come right on time.

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The Best Friend to the Motorist and His Pocket Book

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**Always specify Bosch
You'll be satisfied**

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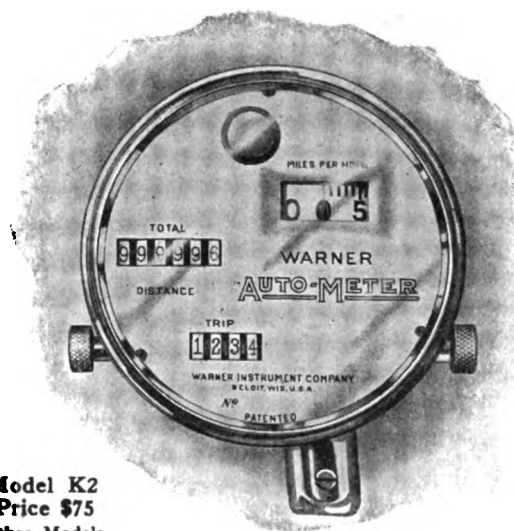
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AUTO BUYERS are now insisting on complete cars. A good car is not complete without a Warner on it. It is the only speed indicator of even quality with a high grade car.

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B & L CASTER FRONT AXLE

Makes a Big Winner in Philadelphia

Our Philadelphia Agent writes it is a Great Success.

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Philadelphia, Pa., February 28, 1912.

Dear Sirs:—The axle is a great success, is running fine. Have made several demonstrations and every one says it's the only front axle that ought to be allowed to go on the automobile, for safety, easy steering and perfect control. Will sell the majority of those I have demonstrated for. Enclosed you will find order for one axle to go on a Studebaker car, 1908 model, more orders will follow later. Send us a big cut for we are going to run a one-half page in our newspaper, we will advertise it right. We will equip at least one thousand cars this year. Our new garage will be at 1907 after March 12th, N. 23rd St. Circulars received all O. K., thanks for same. Rush the order for axle, as every one on a car will sell several more. Yours very truly,

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AGENTS WANTED for all cities in the United States to put the B & L Caster Front Axle on old cars. Exclusive territory given to good men. Our axle when on a car proves that it is the only safe axle made. In buying a new car demand that it be equipped with the B & L Caster Axle. Write for Agency Proposition. Address:

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The Pioneer Moderate Priced Six-Cylinder Car

Havers
Self-
Starting
"Six-44"



Price
\$1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

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Registers mileage. Attached to hub. Sealed so that it cannot be tampered with or disconnected without owner's knowledge. Mileage quickly ascertained—always visible.

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We build motor truck bodies exclusively and guarantee Quality and Service.

Single bodies or quantities.

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THE MAÏS AGENT figures his profit when a truck is sold. It is not a modified pleasure car, but is built in factories for trucks only. Its maintenance expense is no more year after year than when first demonstrated. Its parts are interchangeable, you don't need a machine shop. All parts enclosed and lubricated.

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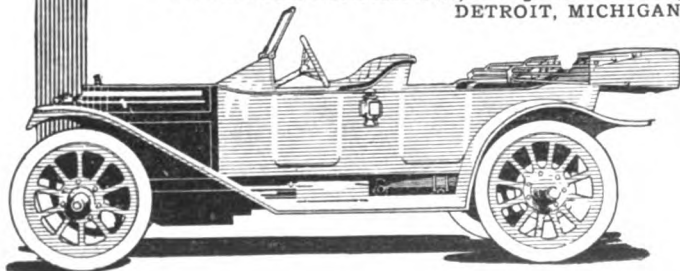
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Next year many cars will offer a long-stroke, small-bore motor. Your customers want one this year. Why not sell them the King "36"?

With Full Equipment,
Including Self-Starter, \$1565

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We have in stock all parts for the transmissions of MORA automobiles. Write us for prices on any parts you may require and save money over having them made up special.

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LASTING IGNITION and LIGHTING SERVICE

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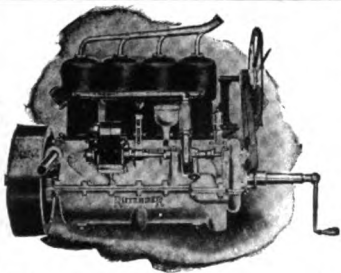
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The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

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That is how many of the leading automobiles won their reputations.

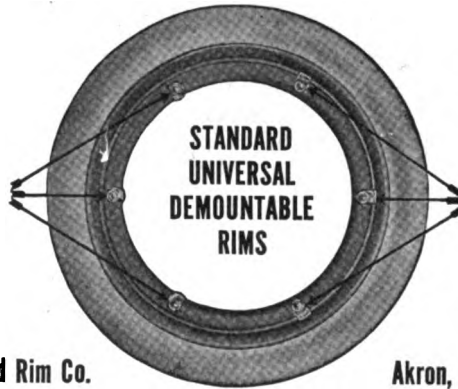
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Turns

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the Rim
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MODEL 95—UNIT TRANSMISSION
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are and have been the recognized quality standard for 20 years. Strong, accurate and durable. Let us cut your sprockets.

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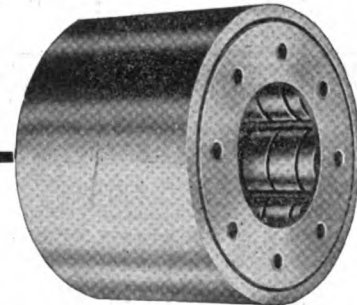
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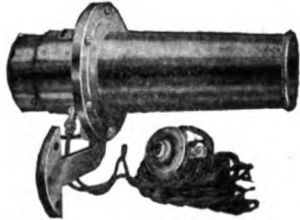
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MOTOR HORN**

Torpedo Type


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Nothing to wear or get out of order. Nothing to watch but the gauge.

Instantly attached and detached. Uses only pure cool air. Costs only \$15.00.

Start the season right. Ask your dealer or write us TODAY.

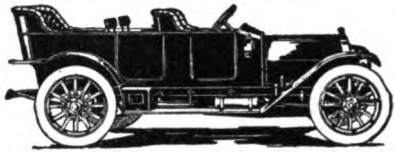
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Speedwell

\$2500 to \$2900

More than this car offers cannot be bought.

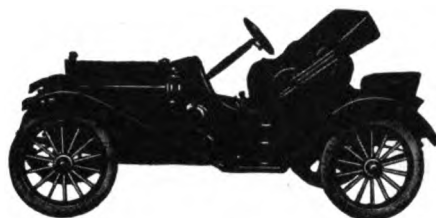
It concedes nothing to its costliest contemporary in structural soundness and strength; in luxury; in ease and comfort; in dignified appearance; or in satisfactory performance—but brings you notable features of design and build that are peculiar to itself.



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Model 12 FS—\$2900
Standard chassis of all Speedwell models has 123 inch wheel base and 50 H.P. motor.

Metz "Twenty-Two" Water Cooled

**\$495**

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Four cylinder motor, twenty-two H. P., valves and all moving parts enclosed and dust proof. Chains enclosed in cases running in oil. High tension magneto ignition. 10,000 miles on set of tires. Ask for Book B, with hill climbing guarantee. Good dealers wanted in unoccupied territory.

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Six Models 40 & 50 H.P. Fully Equipped

Model 40—5 Passenger, Fore Door Touring Car.
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"If You Have Never Driven One Up a Hill You Have Missed Half the Sport of Motoring."

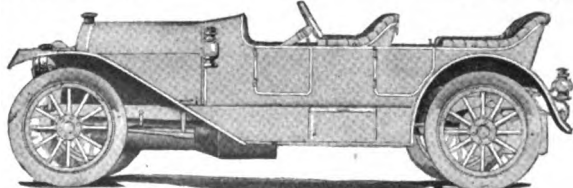


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Stock Champion Road Race Champion



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Pleasure Cars - 7 Models } \$850
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Big, roomy, 5-passenger, open or enclosed car of distinctive design and luxurious appointments. Equipped with self-starting device. It's the car with a thousand little conveniences—

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DEALERS—Wire now for territory which is choice but going fast.

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Converted the Industry

BE not misled—it was the Winton Six, single-handed and alone, that converted the automobile industry from four to six cylinders. It took us four years to convert some makers. But we could only supply the proof of Six Superiority; some men are slower than others to see the light.

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The Winton Motor Car. Co.
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Five
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25 H. P.
Long
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Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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The New Model "40"—\$1450
(Top and Windshield extra)

OUR 1912 LINE is built on four chassis, 30 H. P. to 45 H. P. Large variety of body designs. Prices from \$1000 to \$3000. Established dealers are invited to make application for open territory. Write for advance catalogue.

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Service
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We invite comparisons with any and all manufacturers of automobiles irrespective of price and particularly as respects body lines, finish, and trimming, which he have specialized in for 1912, and so successfully that we feel assured of receiving merited compliments from buyers of the nicest discernment.

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SOLD EVERYWHERE **SHAWMUT TIRE CO., Boston, Mass.**

Abbott-Detroit 1912 MODELS

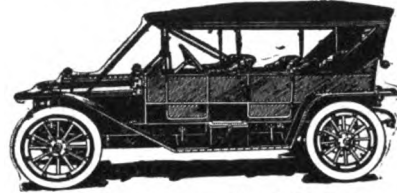
MODEL "44"
 Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats..... **\$1800**
 Fore-door Demi-Tonneau, fully equipped, less top and windshield **1775**
 Fore-door Limousine, fully equipped..... **3000**

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WRITE FOR INFORMATION ABOUT THE SELDEN CAR FOR 1912

MADE BY THE FATHER OF THEM ALL



With complete touring equipment, from \$2250 to \$2600

The Selden Car stands for every desirable development in the automobile—from the powerful perfectly constructed engine to the evenly balanced quality parts that go to make the finished car.

A wide range of body styles and prices. Roadster, touring and torpedo bodies. New four and six passenger torpedo bodies with fore-doors.

Good territory still open for live agents.

SELDEN MOTOR VEHICLE CO., Rochester, N. Y.
GEO. B. SELDEN, Pres. Licensed under Selden patent

Hupmobile

Long-Stroke "32"
 Five-Passenger Touring Car
 \$900 F. O. B. Detroit

Motor $3\frac{1}{4} \times 5\frac{1}{2}$ inches; four cylinders; Bosch magneto; three speed sliding gears; tires, $32 \times 3\frac{1}{2}$ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body, on same chassis and with same equipment, \$900 F. O. B. Detroit.

20 H. P. Models

Runabout—\$750
 F. O. B. Detroit. Same power plant as World-Touring Car. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

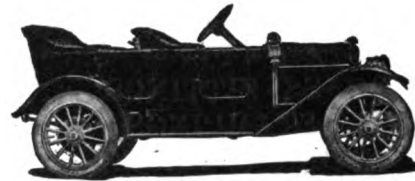
Roadster—\$850
 F. O. B. Detroit. Same chassis and power plant as World-Touring car. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

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The Dealer's Cue for 1912



Our Advance Catalog Tells Everything

MARION "35" Five Passenger Touring Car..... \$1285
Marion "33" Roadster..... 1150
Marion "46," "47," "48"—two, four and five passenger..... 1750

THE MARION SALES CO., Indianapolis, Indiana

Argo Electric Brougham Argo Electric Wagon

Two splendid propositions for live agents. Write for catalog and investigate.

ARGO ELECTRIC VEHICLE COMPANY
 Saginaw, Mich.

The Easiest Riding Car in the World



INTERNATIONAL CHAMPION

A rational, logical car, made on one chassis—a body type for every requirement. Touring car, \$2,750. Ask for Catalog.

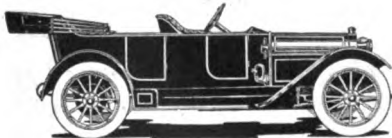
NORDYKE & MARMON CO.

(Established 1851)

Indianapolis, Indiana

Sixty Years of Successful Manufacturing

Mighty Michigan Forty



40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders $4\frac{1}{4} \times 5\frac{1}{4}$ -in. — 116-in. wheelbase— 34×4 -in. tires—demountable rims—nickel mountings—mas-

sive, straight line body—big, roomy seats—proved self-starter—everything. Price \$1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

MICHIGAN BUGGY COMPANY, 188 Lay Blvd., Kalamazoo, Mich.



The American Underslung

WE have published a very interesting book on the advantages of Underslung construction. It is of value to dealer or individual. It tells of our full line which ranges in price from \$1425 to \$4500. Write for a copy.

American Motors Co., Dept. E, Indianapolis, Ind.

SOMETHING EQUAL TO THE BEST WHATEVER THE PRICE

Stands for

**KLINE
KAR**

Satisfied Owners

**4-30 \$1700
\$1850**

**4-40 \$2200
\$2350**

**6-50 \$2800
\$2950**

**6-60 \$3300
\$3600**

The above models completely equipped according to price with Top, Glass Front, Tire Irons, Detachable Demountable Rims, Self Starter, Combination Electric-Oil Side and Tail Lamps, Storage Battery, 4 Speed Transmission.

We have a proposition that will interest any live agent. Complete specifications and catalog upon request.

Richmond, Va.

KLINE MOTOR CAR CORPORATION

York, Pa.

To Automobile Manufacturers

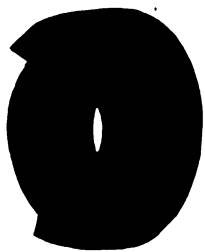
We are the Largest Manufacturers in
the West of

**TURNED BRASS FITTINGS,
BRASS STAMPINGS,
BRASS, BRONZE AND
ALUMINUM CASTINGS**

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us before placing your orders or contracts.

FARIES MFG. COMPANY, Decatur, Illinois

**BRETZ COMPANY
&
S Ball Bearings**
250 West Fifty-fourth, New York



The superiority of

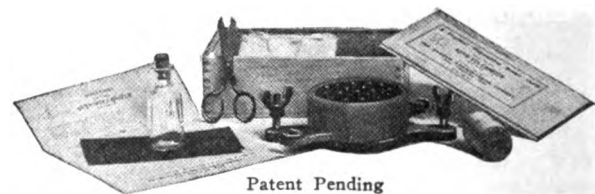
**Schafer
Ball Bearings**

is conclusively proven by the fact
that they are used in the leading cars throughout
the world.

BARTHEL, DALY & MILLER
42 Broadway NEW YORK CITY

WARNING

PATENT NOTICE—Notice is hereby given to the trade, including manufacturers, sellers and users, that the undersigned own all patent rights pertaining to an apparatus for the repair vulcanization of tires, now being manufactured and sold by them, and known to the trade as the **AUTO VULCANIZER**; that steps have been taken to secure the necessary patent protection thereon in the United States Patent Office; and that basic claims covering said apparatus have been declared to be allowable to the applicant under whom they claim title. Warning is hereby given that immediately upon the issue of said letters patent such action will be taken against all infringers, whether making, selling or using said apparatus, or any infringement thereof, as may be necessary to fully establish their rights to the same in the premises. For your protection look for the name.



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Auto-
Vulcanizer**
Ever-Ready

Patent Pending
THE ADAMSON MANUFACTURING COMPANY, Manufacturers, East Palestine, Ohio

Any Kind
Every Kind
Stock, or
to Blue Print

Rims

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Q. D.
Demountable
Channels

**For Automobiles, Motor Trucks,
Aeroplanes, Motorcycles, Bicycles.**

We Also Make Axles and Hubs.

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R. B. ABBOTT SALES CO., Sales Agents, Detroit

"K-B" Universal Joints
FOR
**COMMERCIAL CARS
PLEASURE CARS**

KANT-BEAT

Made from Drop Forgings and
Case Hardened Throughout.

ACCURACY, RELIABILITY AND SATISFACTION GUARANTEED

Prompt Deliveries

KINSLER-BENNETT COMPANY, Hartford, Conn.
American Distributing Co., Jackson, Mich., Western Sales Agents

NUMBER 3 of a series of advertisements dealing with the bulb-horn as a warning device. They will include opinions of prominent motorists, non-motorists, legal authorities, accident claim adjusters, traffic experts, mechanical engineers.

THE TRAFFIC EXPERT

BALTIMORE

Thomas Farnan, Police Marshall (Chief of Police), Baltimore, Maryland, says:

"The thin little noise of the bulb-horn does not count in a city. You need a horn with a note that is loud and strong enough to be heard. The bulb-horn is of no value."

CHICAGO

Sergeant M. W. Delaney, head of Vehicle Bureau, Chicago Department of Police, says:

"The new Chicago ordinance will in time practically wipe out the inefficient signal. As a traffic policeman, I am glad of the opportunity to help along the abandonment of the feeble, inadequate bulb-horn. Once this was excellent, but that time is past, and the public now pays no attention to it."

ST. LOUIS

Sergeant C. H. Loepker, Commanding Traffic Squad, St. Louis Department of Police, says:

"The bulb-horn is worthless, because no one pays any attention to it. The automobile needs a signal that has a harsh, abrupt note that will make a person get back to the sidewalk first and look around afterward."

MEN whose lives are spent in dealing with traffic problems—who are daily face to face with actual traffic conditions—judge the value of automobile warning signals from the standpoint of authority. They know the vital relation between an adequate signal and public safety.

THEIR opinions are important indications that "The bulb-horn must go;" that the signal of the future must be one of greater efficiency, greater reliability, greater warning power; that car manufacturers generally must soon yield to the demand of the buyer for adequate signal equipment.

22 different motor cars are to-day regularly equipped with the Klaxon



LOVELL-McCONNELL MFG. CO., Newark, N. J.

KLAXON

"The Public Safety Signal"



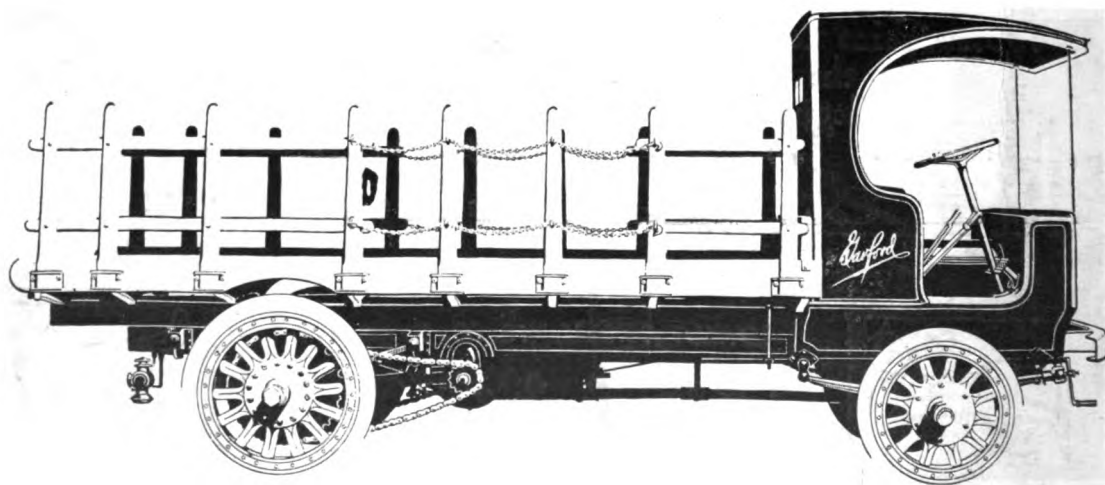
Garford

THE commercial motor car forms an important part of our 20th Century efficiency in business. The right truck is a positive economy, but the wrong one is a deadly expense. One saves, where the other wastes your money.

¶ For a good many years the Garford Company have been solving difficult transportation problems among all classes of important American concerns. This vast and varied experience has built the Garford Truck—the most practical truck in America. To any concern, who has merchandise to be handled, we can give some valuable information, by demonstrating the most economical system of delivery operations. It will be worth your while to investigate.

¶ Write at once for agency particulars and specifications of the full line. Ask for book D.

The Willys-Garford Sales Company, Toledo, Ohio



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